THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Restriction of output has not yet reached its limit in the iron trade, and in some lines new low levels of prices have been reached in the past week. It is a situation from which no sudden turn is to be expected, and buyers and sellers are cautiously and patiently working out the problem. Thus far the producer has suffered most. The next stage in the readjustment process will be reductions in prices of what he buys—labor, transportation and raw materials. Of the latter, fuel has already shrunk markedly; ore will come down in due time. It is well known that enough Lake Superior ore is now down to last well into next summer, so that while this year's shipments are likely to be about 24,000,000 tons, or 3,500,000 tons less than those of 1902, the movement in 1904 will be well below 20,000,000 tons. The effect such a shrinkage will have upon the vessel industry and upon lake labor need not be enlarged upon. The market record of the past week is one of larger business in Southern pig iron with prices yielding further; in finished material buying is of little account and some prices have sagged further. The sharp reduction in pig iron output made in October is still insufficient, as appears from an increase in stocks to 600,000 tons in that month; but November is bringing additions to the idle list and the making of prices that will move the accumulated stocks. With 282,000 tons active blast furnace capacity Nov. 1, based on the output in October, our pig iron production was at the rate of 14,675,000 tons a year, or 4,000,000 tons less than the rate in September and 6,000,000 tons less than the rate in June, when high tide was reached. The Central West will have scarcely more than 40 percent of its September capacity active by Dec. 1, and the South, by sheer force of a loss on every ton sold, must soon contribute to the curtailment movement. The situation there, under the savage competition that has followed the association break-up, is far from reassuring. Even at $9.50 for No. 2 iron the average price on the entire output of a furnace is close to $8, which few furnaces can long stand. The low prices made to rid furnaces of accumulated iron have brought an increase of business in Southern irons. Northern prices are about $1 a ton higher, hence Northern irons are scarcely moving. On No. 2 Southern $9.25 at furnace has been freely named, and this has been cut where more than ordinary tonnage was involved. An Ohio pipe works bought 12,000 tons of lower grades, and another pipe works inquiry represents 10,000 tons. Gray forge ordinarily sells at $8, Birmingham, but a sale has been made at $7.75. On its face the billet situation is in better shape, but time alone will determine the efficacy of pool arrangements. With 24 members, including three steel corporation companies, the pool looks commanding enough, but the staying qualities of some of the newer members are yet to be tested. The Clairton Steel Co.'s adherence was secured after arrangements had been made for the sale of 140,000 tons of its product to the Pittsburg Steel Co. This is the largest single transaction in steel in months. In finished material the uppermost question with pools or with interests controlling a large part of the product in a given line, is the price at which buyers will take hold freely. Plate and shape manufacturers decided that at this time of year lower prices would not materially increase business. Indeed, the decision to add freight to the Pittsburg price in all cases has put shapes at some points. But expected freight reductions will adjust this. In sheets a further reduction of $2 a ton to large buyers has been announced. Extras on heavy steel bars have been cut in two, shutting out German bars and equalizing with iron. The export trade is being pushed and will reach large proportions. A 20,000-ton rail contract taken by the Pennsylvania Steel Co. for the Mecca railroad is an example of what American rail mills propose to do in neutral markets. A conference on Thursday between steel works and trunk line officials is expected to result in important reductions on steel products from mills to the seaboard.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Nov. 18.

The meetings of steel manufacturers held during the past two weeks, at which prices of certain commodities were reduced and others reaffirmed, have not helped the general situation, consumers waiting to see whether present quotations will hold before buying for future requirements. In all lines, the tonnage that is being placed is limited, buyers covering for immediate requirements only. Consumers almost generally believe that further reductions will be made in nearly all lines, while producers are of the opinion that the reductions announced during the past two weeks are sufficiently large to warrant the placing of orders by consumers.

The membership in the billet pool is now at its maximum, 24 concerns agreeing at the meeting held in New York, last Wednesday, to maintain the prices decided upon the week previous. However, this is not for an indefinite period, as a number of the independent companies, who have never before been members, want to see how the agreement will work out. Another meeting is to be held in New York on Dec. 18, when the continuation of the pool as now organized will be definitely decided upon. The only steel producer of importance now outside of the agreement is the Ashland Steel Co., of Ashland, Ky., and it is believed that this concern will shortly abide by the agreement. The Clairton Steel Co. became a member, after certain matters were satisfactorily adjusted, and an order for one year's supply of steel for the Pittsburg Steel Co., amounting approximately to 140,000 tons, had been definitely placed. This is the largest order given in many months. The billet pool as now constituted consists of the following concerns: Carnegie Steel Co., Lorain Steel Co., and the Illinois Steel Co.; Pennsylvania Steel Co., Steelton, Pa.; Bethlehem Steel Co., Bethlehem, Pa.; Lackawanna Steel Co., Buffalo, N. Y.; Cambria Steel Co., Johnstown, Pa.; Jones & Laughlin Steel Co., Pittsburg; Clairton Steel Co., Pittsburg; Wheeling Steel & Iron Co., Wheeling, W. Va.; Sharon Steel Hoop Co., Sharon, Pa.; LaBelle Iron Works, Steubenville, O.; Republic Iron & Steel Co., Chicago; Inland Steel Co., Indiana Harbor, Ind.; Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.; Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; Portsmouth Steel Co., Portsmouth, O.; American Rolling Mill Co., Middletown, O.; Allegheny Steel & Iron Co., Pittsburg; Lukens Iron & Steel Co., Coatesville, Pa.; Diamond State Steel Co., Wilmington, Del.; Alan Wood Iron & Steel Co., Conshohocken, Pa.; Otis Steel Co., Cleveland, O.; Maryland Steel Co., Sparrows Point, Md.

Following the meeting of the billet pool, a meeting of the rail pool was held, at which prevailing questions were reaffirmed. The American Tin Plate Co. has announced a reduction of $4 per ton, 100-pound boxes of coke plates now being quoted at $3.60, f. o. b. mill, Pittsburg, as

compared with $3.80, the last official price. No official announcement has yet been made of a cut in wire and wire nails, but it is believed by the trade that one will be made shortly. It is reported that sheets have been reduced again, but this is unconfirmed. The common quotation is 2.50c for No. 28 gauge in large lots.

The pig iron market continues very quiet and the little flurry of the past ten days has been followed by an almost entire stoppage of buying. The only order of note placed here this week called for 800 tons of Southern foundry for delivery at Louisville, Ky., and it is understood that it was placed at a price shading $9 Birmingham. The low quotations of the Southern producers on both forge and foundry iron the past week have unsettled the market considerably, and while preferred Northern brands continue to be sold at prices ranging from $14.25 to $14.50, where ordinary Southern grades will satisfy, the Northern irons are not even considered in competition. Southern forge is now offered in this market at $12, delivered Pittsburg, equivalent to $7.65 Birmingham, while No. 2 foundry is being freely offered at $13.35 to $13.60.

Coke has suffered a big slump during the week, high grade Connellsville foundry coke being offered at $2.25 at the ovens, while furnace coke is quoted at $1.50 to $1.65. A meeting of the committee appointed by the coke producers to formulate some price agreement was held here Monday, but nothing was done, and another meeting has been called to be held later this week.

The large steel producers who are now seeking the export trade have petitioned the railroads for lower rates on all export shipments, and while freights from all points are likely to be reduced practically one-half for shipments of this kind, no official action has yet been taken. Freight rates on ore, limestone and pig iron will also be reduced about the first of the year, while rates on finished lines will no doubt be lowered to some extent.

Pig Iron.—Additional furnaces banked in the Central West during the week increased the curtailment percentage to 55 and this will easily be increased to 60 before the end of the month. In spite of this heavy curtailment it seems that the production is beyond the consumptive capacity at the present time and many furnaces are piling iron. Northern furnaces are not attempting to meet the quotations made by Southern producers, and prefer to either pile their product or blow out entirely. While Northern forge is being quoted at $13 to $13.25 Pittsburg, the Southern producers are offering it at $12, while Southern No. 2 is being offered and sold in small lots at $13.35 to $13.60, netting the furnaces from $9 to $9.25. Small lots of Bessemer iron have been sold during the week at $14.25 to $14.50 Valley. The furnaces in the Bessemer association are quoting nominally $15, but are doing no business at this price. We revise quotations as follows:

Bessemer, Valley	$14 25 to 14 50
Bessemer, Pittsburg	15 10 to 15 35
No. 1 Foundry	14 75 to 15 00
No. 2 Foundry	14 25 to 14 50
Gray Forge, Pittsburg	13 00 to 13 25
Chilled Basic, Valley	14 25 to 14 50
Chilled Basic, Pittsburg	15 10 to 15 35

Steel.—Now that many large steel producers are affiliated with the billet pool, who heretofore were cutting under the pool prices, it is believed that quotations can be better maintained. Outside of the order for a year's supply of steel, approximating 140,000 tons placed by the Pittsburg Steel Co., there is little doing in billets or bars and no concessions are being offered from pool quotations. Agreement prices are as follows: Bessemer and open-hearth billets, 4 x 4 inches, and slabs, up to and including 0.25 carbon, $23, Pittsburg, Wheeling, Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; 0.26 and including 0.60 carbon, $1 advance, and 0.61 to 1.00 carbon, $2 advance. Billets smaller than 3⅞ inches and sheet and tin bars are $1 per ton extra. Bessemer and open-hearth rods are quoted at $31 Pittsburg, but there is little buying, and no doubt a large order could be placed at $30.50.

Ferro-Manganese.—There has been no change in the price of either domestic or foreign manganese, 80 percent, and it continues to be quoted at $48 per ton delivered at buyer's mill, east of the Mississippi river in carload lots.

Spelter.—The spelter market continues to weaken, and prime Western grades are now quoted at 5.13½c to 5.15c Pittsburg.

Muck Bar.—The market continues quiet and we quote prime muck iron at $27 Pittsburg. This price could be shaded on a fair tonnage.

Skelp.—There is little buying of skelp, grooved and sheared iron being quoted at 1.40c to 1.45c, and steel at 1.35c to 1.40c.

Rails and Track Material.—The rail mill of the Carnegie Steel Co., at Braddock, Pa., will be shut down for several weeks over the holiday season. Extensive repairs are to be made, including the installation of a new engine for one of the mills. At the meeting of the rail manufacturers held last week, quotations were reaffirmed as follows: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $35; less than carload lots, $36; 12 pounds, $30 to $31; 16 and 20 pounds, $28 to $29; 25 to 40 pounds, $26.50 to $27. Track material: Spikes, 1.95c to 2c; track bolts, square nuts, 2.25c to 2.30c; hexagon nuts, 2.40c to 2.45c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 1.80c to 1.85c is asked.

Plates.—The market continues quiet and agreed quotations remain unchanged as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c, at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16-inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Bars.—Despite the recent heavy reduction in steel bars little new business is being placed beyond immediate requirements of consumers. We make the following quotations: Bessemer steel bars, 1.30c; open-hearth, 1.40c; plow beams and cultivator beams, 1.30c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.40c; common bar iron, 1.35c to 1.40c Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance Hoops are quoted at 1.65c, full extras, in 250-ton lots and over, and 1.75c in less than 250-ton lots. Bands are quoted at 1.30c and take the bar extras.

Structural.—A number of the structural mills of the Carnegie Steel Co., which have been idle for some time at Homestead, were placed in operation this week. Generally, the market continues quiet and quotations remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—For immediate acceptance only the American Sheet Steel Co. has announced further concessions to the largest jobbers, amounting to about $2 per ton from actual selling prices and $7 per ton from the last official price of No. 28 gauge black sheets. On galvanized, 75, 10 and 10 is being quoted. These quotations are not being held open nor do they apply to material in transit. Black sheets, in 500 bundle lots are now quoted as follows: No. 28, 2.40c to 2.45c; No. 27, 2.30c to 2.35c; No. 26, 2.20c to 2.25c; Nos. 22 and 24, 2.10c to 2.15c; Nos. 18 and 20, 2c to 2.05c; Nos. 14 and 16, 1.90c to 1.95c; Nos. 10 and 12, 1.80c to 1.85c. Galvanized, Nos. 10 to 17, 2.40c to 2.45c; Nos. 17 to 22, 2.60c to 2.65c; Nos. 22 to 25, 2.80c to 2.85c; Nos. 25 and 26, 3c to 3.05c; No. 27, 3.20c to 3.25c; No. 28, 3.40c to 3.45c; No. 29, 3.85c; No. 30, 4.25c.

Tin Plate.—The American Tin Plate Co. has announced a reduction of 20 cents a box on 100-pound coke plates, making the new price $3.60 per box, f. o. b. mill, Pittsburg.

Wire and Wire Nails.—No official announcement has yet been made of a reduction on wire and wire nails and none is now expected for the next ten days. Cut nails also remain unchanged in price, with little business being offered.

We make the following quotations: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $1.90 to $1.95; plain wire, carload lots, $1.80 to 1.85; barb wire- carload lots, $2.20 to $2.25; staples, carload lots, $2.10 to $2.15. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $1.90, and less than carload lots, $1.95, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2 in carload lots and $2.05 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—As announced last week the shafting manufacturers have reduced all grades of shafting, making the discounts 5 percent greater. On the higher grades of steel slight reductions have also been made. We revise quotations as follows: Turned, cold rolled and ground shafting, 52 off in carload lots and 47 percent off in less than carload lots. Tire steel, 1.70c to 1.80c; spring steel, 2.15c to 2.20c; toe calk, 2.15c to 2.20c. Tool steel is quoted 7 cents and upwards, according to the grade.

Pipes and Tubes.—Little new business is being placed in the larger sizes of pipe, although the largest producer has sufficient business to operate all mills in full until the first of the year. Independents are making concessions from the discounts quoted below of about 5 percent. We quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe.		Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¼ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
½ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3½ to 4 inches	60
4½ to 12½ inches	63

Old Material.—The market continues in an unsatisfactory condition and transactions are few. Under prevailing conditions it is impossible to secure quotations that would represent the market in the various lines, owing to the differences of statements of buyers and sellers.

Coke.—There has been a big drop in coke prices during the week, high grade Connellsville foundry coke being now quoted at $2.25 at the ovens, and furnace at $1.50 to $1.65. On Nov. 2, the H. C. Frick Coke Co. announced a price of $2.65 on 72-hour Connellsville foundry coke, present quotations showing a reduction of 40 cents a ton in a little over two weeks. At the present time foundries are the largest buyers, furnaces not buying owing to the curtailment policies now under way. For the week ending Saturday, Nov. 7, the production of the upper Connellsville region amounted to 149,389 tons, while that of the lower region amounted to 45,316 tons, which is a falling off from the record output of the entire region of nearly 110,000 tons weekly. About 8,000 ovens are idle, while the average operations of the ovens are limited to five days per week.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, Nov. 17.

The most important development of the week is the effort being made by a number of Southern furnaces to prevent further declines in the price of pig iron by the creation of another "gentlemen's agreement." The movement at present is confined to the concerns that were members of the recently disrupted association, though it is the ambition of the originators to have all the furnaces in the South become parties to it, and efforts are being made to bring them into line. The scope of the new agreement is the establishment of a minimum price for Southern pig iron, below which furnaces agree they will not go, rather than for the maintenance of any schedule of values; and it is proposed to make this minimum $9.50 Birmingham for No. 2 foundry. There are many reports in circulation of lower prices than this being offered, but furnaces have stiffened considerably during the past week.

There has been little animation to the market during the week, buying of all kinds of iron and steel being light. The disposition of consumers is to cover only for immediate requirements, though many have sent out large inquiries on which they have asked bids.

A slight change will be announced this week by Eastern mills in the quotations on structural steel. Heretofore producers have been selling shapes in this territory on the basis of 1.75c Chicago, but in future the Pittsburg prices will be named with the freight rate to the point of delivery added, making an increase of 1½ cents per 100 pounds on mill shipments in the Chicago territory.

The plate mill, slabbing mill and open-hearth furnaces of the Illinois Steel Co. at South Chicago were started up again yesterday after a shutdown of three weeks, the company having received orders and specifications for about 2,500 tons. This is offset, however, by the shutdown of the entire plant of the Inland Steel Co. at Indiana Harbor, part of which, consisting of the blooming mill, bar mill and open-hearth furnaces, will probably be started up again next Monday if the repairs that are to be made are completed by that time. The sheet mill will remain idle for an indefinite period owing to the refusal of the employes in this department to consent to a revision of the wage scale.

Pig Iron.—A number of large inquiries have been sent out during the week, though as yet none of them has resulted in business, and it is generally believed there is little probability of contracts being let for some weeks to come. One of these is for 2,500 tons of No. 2 foundry; another for 1,000 tons of No. 2 and 500 tons of No. 1; another for 1,000 tons of No. 2; two for 500 tons each of No. 2 and one for 1,000 tons of malleable Bessemer. The buying during the week has been largely of a carload nature, a condition of trade which suits furnaces better as long as prices continue on their present level. Quotations, however, have stiffened as a result of the efforts being made by Southern furnaces to prevent further declines from the basis of $9.50 for No. 2 foundry, sellers reporting that they are holding firm at this figure. Northern irons continue quiet, prices being firm at the quotations given below:

Lake Superior Charcoal	$16 50 to 17 50
Northern Coke Foundry No. 1	15 00 to 15 50
Northern Coke Foundry No. 2	14 50 to 15 00
Northern Coke Foundry No. 3	14 00 to 14 50
Northern Scotch Foundry No. 1	16 00 to 16 50
Ohio Strong Softeners No. 1	17 30 to 17 80
Ohio Strong Softeners No. 2	16 80 to 17 30
Southern Coke Foundry No. 1	13 85 to 14 35
Southern Coke Foundry No. 2	13 35 to 13 60
Southern Coke Foundry No. 3	12 85 to 13 10
Southern Coke Foundry No. 4	12 35 to 12 60
Southern Gray Forge	12 10 to 12 35
Southern Mottled	11 85 to 12 10
Southern Silveries (4% to 6 % Silicon)	15 35 to 16 35
Jackson Co. Silveries (6% to 10% Silicon)	18 80 to 19 80
Alabama and Georgia Car Wheel	21 85
Malleable Bessemer	15 50 to 16 00
Basic Iron	13 85 to 14 35

Billets.—The market has been quiet, sales being limited to a few small lots of forging billets. We quote mill shipments, carload lots, Bessemer and open-hearth billets, $24; small lots from store, 1.30c to 1.40c.

Bars.—No appreciable increase is noted in the volume of business since the announcement of the cut in the price of steel bars, and consumers are continuing the policy of sending in orders and specifications for lots of sufficient tonnage to cover their requirements for a few weeks.

Buyers showed a marked disinclination to accumulate stocks of any kind in their yards and are maintaining a very narrow margin between their consumption and material on hand. Some jobbers have purchased fair sized lots, but in several cases have insisted on a guarantee against future declines. The market on both iron and steel lacks stability, though mills are holding firm at the quotations given below. Buying of iron bars has been light, pretty much the same conditions ruling here that apply to steel. We quote mill shipments, carload lots, Chicago delivery: Irons, 1.40c to 1.45c; Bessemer steel, 1.46½c; angles less than 3 x 3, 1.56½c base. half extras; hoops, 1.91½c; (in lots of 250 tons and greater, 1.81½c). Jobbers' quotations on carload lots and less: Iron, 1.65c to 1.75c; steel, 1.60c to 1.70c; small angles, channels and tees, less than 3 x 3, 1.70c to 1.80c.

Sheets.—There is little improvement in the demand for sheets, which continues only moderately good. Prices are being shaded, each transaction being a law unto itself, quotations having been made as low as 2.56½c Chicago for No. 28 gauge. This price is not general, however, and we continue to quote mill shipments carload lots, No. 27 gauge, black, 2.60c to 2.65c; No. 28, 2.70c to 2.75c; galvanized, 75, 10 and 5 percent discount. Warehouse trade is brisk and jobbers are holding firm at the following quotations: No. 22 and 24, 2.70c to 2.80c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c. Galvanized from store, 75 and 5 percent discount.

Plates.—The leading local interest has started up its plate mills at South Chicago after a shutdown of three weeks, orders and specifications having been received for about 2,500 tons. Independent producers are shading the official prices on such orders as they can obtain. Store trade in small lots is fairly brisk. We quote mill shipments, Chicago delivery: Tank steel, ¼-inch and heavier, 1.75c; flange steel, 1.85c. On lots from store, we quote: Tank steel, ¼-inch and heavier, 1.90c to 2c; 3-16, 2c to 2.10c; No. 8, 2.10c to 2.20c; No. 10, 2.15c to 2.25c; flange steel, 2.25c to 2.35c, all f. o. b. warehouse.

Structural Steel.—Transactions are light and specifications are hard to obtain. Local selling offices report that after this week structural steel will be sold at the Pittsburg price with the freight to point of delivery added, making an increase of 1½ cents per 100 pounds in the Chicago price. We quote mill shipments, Chicago delivery, as follows: Beams and channels, 16 inches and under, 1.76½c; 18 inches and over, 1.86½c; universal plates, 1.75c; angles, 3 x 3 and larger, 1.76½c; tees, 3 x 3 and larger, 1.81½c; zees, 1.76½c. On lots from store, we quote beams, channels and angles, 3 x 3 and larger, 1.90c rates; 18, 20 and 24-inch, 10 cents extra; tees, 1.95c rates.

Merchant Steel.—A few contracts from both the manufacturing and jobbing trade have been received during the week, while specifications continue of good volume. The discount on cold rolled shafting has been increased 5 percent. We quote mill prices, Chicago delivery: Spring steel, 2c; sleigh shoe, flat sizes, 1.60c; concave and convex, 1.75c; cutter shoe, 2.25c to 2.35c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.05c. Ordinary grades of crucible tool steel, 6c to 8c; specials, 12c and upwards. Cold rolled shafting in carload lots, 52, and in less than carload lots, 47 percent discount from list.

Merchant Pipe.—There is no change to be noted in the demand, which continues good from all sources. We quote carload lots to consumers, mill shipments, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ⅜ inch inclusive.....	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches inclusive.....	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—New business is of good volume, mills generally being sold for several weeks ahead. Jobbers report there is a good demand from warehouse stocks, all sizes being in request. Prices are without change. We quote carload lots from mill, Chicago delivery, as follows:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ in.	40.85	37.35	53.35
1¾ to 2½ in.	53.85	36.35	40.35
2¾ to 5 in.	59.35	49.35	Up to 4 inches.
6 to 13 in.	53.85	36.35	48.35

For car lots or less, direct from warehouse stock:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ in.	40	35	37.50
1¾ to 2½ in.	50	32.50	35
2¾ to 5 in.	57.50	42.50	Up to 4 inches.
6 to 13 in.	50	32.50	45

Cast Iron Pipe.—The bulk of orders received are for small lots, these coming from all sections of the country. The following quotations could be shaded on a large order. We quote carload lots, f. o. b. Chicago: 4-inch pipe, $29; 6-inch and upwards, $28; gas pipe, $1 a ton higher.

Rails and Track Supplies.—There is a good demand for light rails, some mills reporting their capacity taken for several weeks ahead. Orders for several thousand tons of heavy sections have also been closed, with inquiry for a considerably greater amount. Much of this, however, is regarded in the nature of "feelers," being generally withdrawn after a price had been named. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carlots, $32; second quality rails, $27; 25-pound rails, $28 to $30; 12-pound rails, $30 to $32, with regular differentials for intermediate sizes. Track supplies, mill shipments, angle bars, 1.80c to 1.90c; spikes, first quality, 2c to 2.10c (out of store, 2.20c to 2.30c rates); second quality, 1.70c to 1.80c; track bolts, 3½ x ¾, with square nuts, 2.70c to 2.80c per 100 pounds; with hexagon nuts, 2.85c to 2.95c, with usual differentials for other sizes.

Wire and Wire Nails.—Buying continues to be of good proportions, and the leading interest reports no change in prices. We quote to jobbers, Chicago delivery, as follows: Wire nails, carload lots, $2.15; less than carload lots, $2.20. Cut nails, steel, carload lots, $2.05; less than carload lots, $2.10. Plain wire, $2.05c carloads, and $2.15 in smaller lots; galvanized plain wire, carloads, $2.35; smaller lots, $2.40. Painted barb wire, carloads, $2.45; less than carloads, $2.50; galvanized, carloads, $2.75; less than carloads, $2.80; staples, carloads, $2.30; smaller lots, $2.35; galvanized, carloads, $2.70; smaller lots, $2.75. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliest or DeKalb with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—Owing to the strike in the Colorado district, dealers in this city have been called upon to supply an ever increasing demand from Western and Southwestern points, which has cleaned up the stocks held in this city. There is no marked change in the situation so far as prices are concerned, standard 72-hour Connellsville being held firm at $2.65 at the ovens. New River and Pocahontas coke ranges from $5 to $5.25 Chicago.

Old Material.—There is no improvement in scrap and values have a downward tendency. Demand is very limited, such sales as are made being generally closed at a sacrifice. The following quotations are merely nominal. We quote dealers' selling prices, gross tons, as follows:

Old iron rails	$15 00 to 15 50
Old steel rails (mixed lengths)	9 50 to 10 00
Old steel rails (long lengths)	13 00 to 13 50
Relaying rails	24 00 to 25 00
Old wheels	15 50 to 16 00
Heavy melting steel	10 00 to 10 50
Mixed country steel	8 50 to 9 00

The following are selling prices for net tons:

No. 1 R. R. wrought	$12 00 to 12 50
No. 2 R. R. wrought	10 50 to 11 00
Shafting	12 50 to 13 00
Dealers' forge No. 1	10 50 to 11 00
No. 1 busheling and wrought pipe	9 00 to 9 50
No. 1 cast	11 50 to 12 00
Heavy cast (300 pounds and over)	9 00 to 9 50
Agricultural malleable	10 00 to 10 50
Iron axles	15 00 to 15 50
Steel axles	12 50 to 13 00

No. 1 boilers, cut	9 00 to 9 50
Cast borings	3 50 to 4 00
Mixed borings, etc.	3 50 to 4 00
Wrought turnings	6 50 to 7 00
Machine shop turnings	6 50 to 7 00
Iron axle turnings	7 00 to 7 50
Steel axle turnings	6 50 to 7 00
Stove plate and light cast scrap	9 00 to 9 50
Old iron splice bars	12 50 to 13 00

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Nov. 17.

As the close of the season of navigation approaches, the prospect for the ore business is far from satisfactory. Reports from furnaces show that they have large stocks on hand, so large that few will need to take much ore from dock this winter. It is expected that there will be more ore on dock Dec. 1 than there was last year and that a very large part of it will stay there until spring. Owing to these conditions, an officer of a company which operates extensively on both the old and new range predicts that the total shipments for 1904 will not exceed 15,000,000 tons. Others do not take so gloomy a view; but admit that shipments next year will probably fall below those of this year, which will be about 24,000,000, or 3,500,000 tons short of 1902. The Pittsburg Steamship Co. has finished its shipments of ore for the season and its vessels not out of commission are hauling coal and grain. It is believed that the steel corporation has enough ore in furnace yards and on dock to last it nearly through the summer of 1904.

Pig Iron.—There is increased activity at lower prices, especially in Southern iron, on which the usual price is now $9.25 Birmingham for No. 2, and $8 for gray forge, or $13.10 and $11.85 Cleveland. A pipe company in North Central Ohio purchased 12,000 tons of Southern at a price not announced. A significant fact is that, although until very recently Southern furnaces were unwilling to sell for next year's delivery at current prices, they are now selling freely for delivery till April. Several large producers in the South are complaining that they cannot make iron and sell at present low prices except at a loss. Several furnaces have blown out recently in the South and others are expected to follow. While prices of Northern iron are not as weak as those of Southern, they have declined somewhat. We quote as follows for Cleveland delivery, save on Northern gray forge, which is at Valley furnace:

Bessemer	$15 50 to 15 75
No. 1 Strong Foundry	14 75 to 15 25
No. 2 Strong Foundry	14 00 to 14 50
No. 3 Foundry	13 75 to 14 25
No. 2 Southern	13 10 to 13 25
Gray Forge, Valley furnace	13 00 to 13 25
Gray Forge, Southern	11 85 to 12 00
Lake Superior charcoal	16 50 to 17 00

Finished Material.—A slight increase in sales and marked improvement in specifications against contracts have followed the recent reduction in the price of steel bars to 1.30c Pittsburg for Bessemer and 1.40c for open-hearth. A further reduction was made this week on rounds and squares above 3 1/16 inches by cutting the extras from one-half to one-quarter. This makes the new extras as follows: 3 1/16 to 3½ inches, $1.50 per ton; 3 9/16 to 4, $2.50 per ton; 4 1/16 to 4½, $3; 4 9/16 to 5, $4; 5⅛ to 5½, $5; 5⅝ to 6, $7.50; 6⅛ to 6½, $10; 6⅞ to 7¼, $12.50. These quotations are made both to shut out imports of heavy German bars and to compete with iron bars, which are usually quoted at 1.30c at the mill, but have sold within a few days at 1.27½c. The demand for iron has decreased since the decline in prices of steel. Pressure for concessions on structural material has not been as strong as might have been expected since the new schedules on other lines were announced. Many bridge building companies and jobbers have large stocks of structural shapes on hand and do not desire to see prices decline. Architects and prospective bidders are, however, calling for lower prices and saying that they must be made to prevent the stopping of many building operations planned for 1904. Reduced prices are announced on sheets; that is, below the last prices of the principal producer, announced for publication, which were on a basis of 2.75c for No. 27. But those prices have not ruled for months, the quotation in these columns recently having been 2.40c to 2.45c for No. 27. The new quotations of the principal producer are on a basis of 2.40c for No. 27 one pass, cold rolled block sheets in carload lots, while some other sellers quote on a basis of 2.35c. The quotations of the principal producer for mill sales through jobbers are as follows: No. 10, 1.85c; No. 11-12, 1.90c; No. 14, 1.95c; No. 16, 2.05c; No. 27, 2.40c; No. 28, 2.50c. Galvanized, 75, 10 and 5 off for ordinary business and 2 percent additional off on desirable orders. Out of stock, prices are as follows: No. 10, 2.10c; No. 12, 2.15c; No. 14, 2.20c; No. 16, 2.30c; No. 18-20, 2.40c; No. 24, 2.45c; No. 25-26, 2.50c; No. 27, 2.55c; No. 28, 2.65c; No. 30, 3.10c. Galvanized, out of stock, No. 16, 75 and 7½ off; No. 18-20, 75 and 10 off; No. 22-28, 75, 10 and 2½ off.

Old Material.—Sales are reduced to a minimum and large quantities of scrap are being stored and held in the hope of an advance. Prices are nominal on account of the small number of transactions. We quote the following gross tons, Cleveland:

Old iron rails	$16 00 to 17 00
Old steel rails (over 6 feet)	13 00 to 14 00
Old steel rails (6 feet and under)	12 00 to 13 00
Old car wheels	14 50 to 15 00
Steel boiler plates	12 00 to 14 00
Malleable iron (railroad)	13 50 to 14 00
Malleable iron (agricultural)	12 00 to 13 00
Heavy steel	12 00 to 13 00

We quote the following net tons:

No. 1 R. R. wrought	$13 00 to 14 00
Mill scrap	10 00 to 11 00
No. 1 machine cast scrap	11 00 to 12 00
Iron axles	16 00 to 16 50
Axle turnings	10 00 to 11 00
Wrought turnings (free from cast)	7 00 to 8 00
Uncut wrought iron boilers	6 00 to 7 00
Grate bars	9 00 to 10 00
Pipes and flues (clean)	9 00 to 10 00
Tank iron	9 00 to 10 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	7 00 to 8 00
Stove plate	9 50 to 10 50
Steel axles	16 00 to 17 00
Cast borings	3 75 to 4 00

The Bassett-Presley Co., jobber in iron and steel, has moved to more commodious quarters on the third floor of the Western Reserve building from the fifth floor, in which it had long been located.

CINCINNATI.

Nov. 17.

The coke market is quiet and easy and for standard brands $2.50 to $2.65 f. o. b. ovens is quoted, while other brands are quoted at $2.35 to $2.50 at ovens for foundry grades. Orders are not coming in with any freedom and small lot business is the order of the day.

Pig Iron.—Another decline has taken place in Southern iron the past week and quotations and sales have been made at $9 Birmingham for No. 2 foundry. This basis is not being named by all furnaces in the South, but there are some which have found it necessary to make this figure on quick shipment iron and the explanation is given that the price was cut to realize on product on hand, this being regarded preferable to carrying the stock and allowing interest to be added to the cost of the product. The open quotation of the leading furnace interests is $9.25 Birmingham. Current prices are mainly for shipment in the next 60 to 90 days and cover lots of from 50 tons to 200 tons. There are a few good inquiries in the market. Early in the week a pipe manufacturer in Ohio bought 12,000 tons for deliveries extending through February and another large pipe maker is in the market for 10,000 tons or more. A sale of 500 tons of gray forge is reported at $7.75 Birmingham, which is the lowest price named as yet on the present decline. Buyers are apparently contesting prices on every order and securing concessions in places. This makes the market unsettled and irregular. An order for a 1,000-ton lot for delivery in Louisville is said to be bringing out some low figures. While the market is in this easy and drooping condition the trade is looking for the end of the lowering of prices, as cost lines have been passed in many cases and each decline limits the number of furnaces that are willing to follow the market

to extreme inside figures. Several sales agents now admit that they are out of the competition as they have nothing to offer at the present level of values. The demand in a general way does not improve and foundrymen report business dull. A feature of the trade now is selling by analysis instead of grade. This may in a measure account for the irregularity in quotations. The following are the prices current f. o. b. Cincinnati:

Southern Foundry No. 1	$12 25 to 12 50
Southern Foundry No. 2	11 75 to 12 00
Southern Foundry No. 3	11 25 to 11 50
Southern Foundry No. 4	11 00 to 11 25
Southern Foundry No. 1 soft	11 25 to 12 50
Southern Foundry No. 2 soft	11 75 to 12 00
Gray forge	10 50 to 10 75
Northern Foundry No. 1	15 90 to 16 15
Northern Foundry No. 2	15 40 to 15 65
Northern Silvery (8% silicon)	18 65 to 19 15
Southern car wheel iron	18 00 to 18 75

Finished Material.—The price changes in several lines are the features of interest this week. It will be remembered that important interests some time ago guaranteed prices on steel bars to the trade against a decline. On all business not actually in transit on Nov. 6 or before, whether the price was guaranteed or not, the new schedule is being protected, but on anything shipped prior to Nov. 6, the old price basis rules. A new local price is announced for structural iron to take effect Nov. 20. This is based on 1.60c Pittsburg, which, with the freight rate added, makes the Cincinnati delivered price 1.73c, as against 1.70c, which was the price under the territorial plan of making delivered prices. The leading interest has held its quotations on heavy sheets, but the independents are competing for business and the market is easy. On light sheets reductions have been made. All along the line there is an easy tone. Small orders for structural shapes are going at easy figures and there is no advance contemplated even though the carload price will be 3c higher after the 20th. The demand is only fair, and while there is some store business doing, there is no steady run of orders and nothing to give confidence in the immediate future. Bar iron is easier and a quotation of 1.42c Cincinnati is now an open price on car loads. Steel bars are quoted 1.43c base, half extras, with the retail price 1.90c for iron and steel out of store. Galvanized sheets are being quoted at 75 and 10 percent off. We quote black sheets. No. 27 at 2.55c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.90c; No. 27, 2.80c; No. 16, 2.55c; No. 14, 2.45c; No. 12, 2.35c; No. 10, 2.30c. Tank plates are easier and sell out of store at 2c for ¼-inch and 2.10 for 3-16-inch. Beams and channels are quoted at 1.90c to 2c from stock, and angles at 1.90c to 2c for base sizes. In merchant pipe the market is not quotably changed, but it may be said that independent mills are cutting more of a figure in the market and are taking business at concessions.

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed. Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼, ⅜ inch	60.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12-inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	27.7
1¾ to 2½ inch	54.2	36.7
2¾ to 6 inch	59.7	46.7
6 to 13 inch	54.2	36.7

Old Material.—It is reported to be the policy of scrap dealers to hold prices and they do not appear to be competing for orders and show a disposition to wait for better conditions. We quote:

Old No. 1 railroad wrought, net tons	$12 00 to 12 50
Cast machine and foundry, net tons	11 00 to 11 50
Old iron rails, gross tons	17 00 to 18 00
Old steel rails, gross tons	13 00 to 14 00
Old short lengths, gross tons	13 50 to 14 50
Old iron axles, net tons	15 00 to 16 00
Stove plate, net tons	9 00 to 9 50
Wrought turnings, net tons	11 00 to 11 50
Cast borings, net tons	6 00 to 6 50

PHILADELPHIA.

Nov. 17.

The iron and steel market is still in an unsatisfactory condition and the opinion prevails that it will not be much improved this winter. Owing, however, to the curtailment in production of pig iron, prices of that product are steady. The best feature of the situation is that the readjustment of prices of finished material is proceeding in such a way as not to cause the demoralization experienced in past years.

Pig Iron.—The market is extremely dull, but prices are not lower and are not expected to be changed to any great extent for several months at least. We quote: No. 2 X foundry, $15 to $15.50; No. 2 plain, $14.25 to $14.75; standard gray forge, $14 to $14.25; ordinary gray forge, $13.25 to $13.75; Southern No. 2 X rail shipment, $13.75 to $14.25; Southern No. 2 X on dock, $13.25 to $13.50.

Steel.—Buyers are satisfied to cover their requirements at $24.25 to $25 delivered, but business is not active. The situation is not likely to show much change this year.

Finished Material.—The decision not to reduce prices on plates and structural material has caused a more settled feeling. Manufacturers generally agree that the 1.60c base, Pittsburg, for these products is a fair price. Steel bars, small angles and refined bar iron are quoted at 1.43½c for the two former and 1.40c for the last named.

Old Material.—There is still little demand for scrap and prices are irregular. We quote: Old steel rails, $12.50 to $13; miscellaneous heavy steel, $12 to $12.50; low phosphorus scrap, $20 to $21; old steel axles, $16 to $17; old iron axles, nominal, $19 to $20; old iron rails, nominal, $16.75 to $17.50; old car wheels, nominal, $15.50 to $16; choice R. R. No. 1 wrought, $16 to $16.50; country scrap, $14 to $14.50; machinery cast, $13 to $14; No. 2 light scrap, forge, $12 to $12.50; No. 2 light scrap, ordinary, $9.50 to $10; axle turnings, $11.50 to $12; wrought turnings, $10 to $10.50; wrought turnings, choice heavy, $10.50 to $11; cast borings, $6.75 to $7.25; stove plate, $10 to $11; wrought iron pipe, $12 to $12.50.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., Nov. 18.

Pig Iron.—Buying to supply immediate wants is the only attraction the market has for consumers nowadays. Southern irons have furnished nearly all of the activity of the past week, a good tonnage having been placed in lots ranging from 25 to 500 tons, the average sale being about 100 tons. Southern No. 2 foundry has been selling at from $9.50 to $9.75, Birmingham basis, but $9.25 has been done. One large interest has refused bids for good quantities at this figure, claiming that there is no profit in such a price. Deliveries from the Birmingham district are becoming very unsatisfactory because of the car shortage, and there is no relief in sight. There has been considerable published about Southern furnaces refusing to close contracts at present figures for next year. This is incorrect, as purchases can now be made for delivery for the first three months of 1904 at prevailing prices. Buyers cite this as one of the reasons why they are justified in buying on the hand-to-mouth plan, and while not asserting that the market during the next few months will be in their favor, are certain that it will not go against them. Southern furnaces are giving considerable attention to the export trade, and plenty of correspondence and cabling is being done nowadays in connection with it. We know of a sale of 200 tons of Southern No. 1 foundry to Hawaii at $10.25, Birmingham. Northern irons are only fairly active, but prices remain pretty firm. New York prices are as follows: Northern No. 1 X, $15.75 to $16.25; No. 2 X, $15.25 to $15.75; No. 2 plain, $15 to $15.50; No. 1 Southern foundry, $13.75 to $14; No. 2, $13 to $13.50; No. 3 foundry, $12.75 to $13; No. 4 foundry, $12.25 to $12.50.

Finished Iron and Steel.—All departments of the finished material market are quiet. The reaffirmation of the prices of structural shapes has not had any effect on the big propositions that have been hanging fire so long. One for 9,000 tons is in a fair state for closing in the near future, however. Many railroad requirements are held up simply because of the unsatisfactory money market, or pending the flotation of securities. Plates are exceedingly dull, and it is not a question of price either. Bars are fea-

tureless, and only moderate lots are changing hands. Reduced prices for sheets were responsible for an increased volume of orders, but there is room for plenty of improvement. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.79c to 1.86c; flange, 1.90c to 2c; firebox, 2.10c to 2.20c; refined iron bars, 1.30c to 1.40c; soft steel bars, 1.40c to 1.45c; steel sheets, in carloads, New York, No. 28 black, 2.50 to 2.60c; galvanized, 75 and 10 to 75 and 5 off.

BIRMINGHAM, ALA.

Nov. 18

It is difficult to arrive at the true situation of the iron market as this time. Certain it is that iron is being sold at a loss, and that few if any of the manufacturers here will continue such a policy for any length of time. Such business as is being booked now (and the tonnage is increasing) is practically all for immediate shipment or for deliveries not extending over more than 60 days, as all buyers for forward delivery are met with the statement that no sales for future shipment are desired if on basis of prices now ruling. This is taken as an indication that unless prices show a material improvement soon, many furnaces will be closed down. During the month of October 132,403 tons of pig iron moved out of the district, which shows that shipments and consumption at home somewhat exceeded the product. Since Nov. 1 stocks have been reduced still further. It is generally admitted that Southern prices are considerably below those asked by Northern makers and that Southern iron is alone in competition with itself, so to speak. Some makers who have for several months accumulated large stocks seem determined to move them and are making extra concessions to desirable trade to accomplish such purpose. The export business has been fairly begun. To what extent it will continue is as yet problematical. Charcoal iron is suffering from the same dullness that has characterized the coke iron market and stocks have accumulated, owing to large orders for the last quarter of the current year having been held up by railroads and carwheel manufacturers. Quotations today are as follows:

No. 1 foundry	$10 00
No. 1 soft	10 00
No. 2 foundry	$9 25 to 9 50
No. 2 soft	9 25 to 9 50
No. 3 foundry	8 75 to 9 00
No. 4 foundry	8 50 to 8 75
Gray forge	8 00 to 8 25
Mottled	7 75 to 8 00
Alabama car wheel	16 00 to 17 00

Coke is available at $3 to $3.25 for foundry purposes, with a good inquiry from the Western and Mexican smelters, owing to the strike of the Western miners. However, lack of equipment has thus far prevented any material movement of coke to the West and Southwest. Coal is a little slower, ruling at prices varying from $1.15 to $1.40, according to quality, for steaming purposes. The coal miners will continue on the same basis for the Pratt mines for digging coal as for October.

The Birmingham Rolling Mill and the Tennessee Coal, Iron & Railroad Co.'s steel plant at Ensley have closed down, owing to lack of orders and suspension of deliveries on those booked.

The receivers of the Southern Car & Foundry Co. announce that an order for 400 cars has been practically closed, insuring the operation of the Anniston plant of the bankrupt concern for some 60 or 90 days to come.

The Colorado Fuel & Iron Co. has given notice that it will shut down its Minnequa steel plant in Pueblo and surrender its large coal supply for the use of the Denver market and the State. Four thousand men will be out of employment, while the 30,000 tons of coal stored at the plant will be shipped to meet the demands in Denver and other places for fuel. This action is caused by the strike now in progress of coal miners in Colorado.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*, ROOM 1909, NO. 150 NASSAU ST., Nov. 18.

Pig Tin.—Market conditions have undergone practically no change during the week, outside of the feverish undertone which existed. Business is at an exceedingly low ebb, and consumers do not seem willing to do anything toward reviving it. The London market has been at a standstill also, and prices show but little change. Today's closings at the Metal Exchange were as follows: Spot to December, 25.10c to 25.50c. London's closings today follow: Spot, £116 12s 6d; futures, £117 15s. Arrivals at Atlantic ports for the month to date amount to 1,542 tons, with 1,105 tons afloat.

Copper.—Since our last report the official quotations—which are those at which large producers will sell—have been twice reduced, making the total reductions ¼c in Lake, and ½c in both electrolytic and casting. The recessions were caused by the opening of the Montana mines, and by consumers being completely out of the market. The dullness in trade which prevails could hardly be worse. The London market has been especially weak, and prices are lower by at least £3 since we last quoted them. Closing prices at the Metal Exchange today were, nominally, as follows: Lake, 13⅜c; electrolytic, 13⅛c; casting 13c. London's closings today follow: Spot, £55 15s; futures, £55 10s. Exports for the month to date aggregate 5,769 tons, against 5,999 tons for a similar period last year.

Lead.—The American Smelting and Refining Company today changed its price from 4.40c to 4.10c for 50 ton lots, shipment in 30 days. Spot supplies command 4.25c. St. Louis is lower at 4.20c, while London is unchanged at £11 1s 3d.

Spelter.—Is weak and lower at 5⅝c for spot, and 5¼c nominal for November to December. St. Louis is considerably easier at 4.75c to 4.95c. London declined to £20 15s.

Antimony.—Cookson's is 7¼c, Hallett's 6¼c, and outside brands 5¾c.

Quicksilver.—Is quoted at $46.50 per flask of 76½ pounds in lots of 100 flasks. London is £8 7s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton, and 50c and 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*, 1115 MONADNOCK BLOCK Nov. 18

The sagging tendency of metals towards lower prices continues, and copper is fractionally lower than a week ago. Buyers are purchasing in small lots. We quote Lake copper, carload lots, 13½c; smaller quantities, 13¾c; casting, 13¼c to 13½c. Pig tin, carload lots, 25c; lesser lots, 26½c. Pig lead, 4.40c in 50 to 100-ton lots, and 4½c to 4¾c in small quantities. Spelter, 5.60c in carload lots, and 6c in small quantties; sheet zinc, 6c; antimony, 7¼c to 7¾c for both Cookson's and Hallett's. Old metals are without change, though the tone of the market is weaker. We quote dealers' selling prices as follows: Copper wire, $11.50 to $11.75; heavy copper, $11.25 to $11.50; light copper, $10.50 to $10.75; red brass, $10 to $10.25; red brass turnings, $8.50 to $8.75; yellow brass, $7.50 to $7.75; yellow brass turnings, $6.50 to $6.75; lead, $3.90; zinc, $4.25; pewter, $17.

The appraisal of the property of H. Silberman & Co., Cleveland scrap dealers, who failed recently, shows assets amounting to $101,420.28 and liabilities of $197,473.97. The assets include stock valued at $11,585; machinery and fixtures, $6,145; book accounts, $31,921; and notes and other assets, $51,702. The property owned by H. Silberman is appraised at $67,100 and his assets are given as $90,000.

On petition of the Republic Iron & Steel Co., and other creditors, with claims for $6,000, the State Bank of Chicago has been appointed receiver of the Mackie Steel Tube Mfg. Co., of that city.

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A POINT CONCERNING WAGE REDUCTIONS.

There is little question that a general movement has been started toward reducing cost of manufacture. The usual course of procedure is to dismiss all employes whose services are manifestly unnecessary, and to reduce the salaries or wages of the balance by a certain percentage. There is a great deal of question whether the latter course always achieves the result which has been aimed at. It is only natural to doubt whether a man who has had his income reduced will render the same services as formerly. There is also a general economic objection, in that consumption depends upon earning power, and where it has been cut down, the general demand for manufactured goods has been reduced by that amount.

It is well to look at what is in many quarters regarded as the principal cause of the present depression —a high labor cost due not so much to greater daily wage payments as to a decreased amount of work done per day for those wages, whatever they may be. It is easy to see that as the tide of demand for labor rises and falls, if on every rise the workman reduces the amount of work per day, receiving at the same time higher daily wages, and if on every fall wages are reduced, tending also to reduce the amount of work done, or at least the zeal with which the task is undertaken, then a condition will finally be reached where the daily wage is not greatly different from what it was at the start, yet by a continued succession of changes in the same direction the amount of work done per day has become extremely small.

However it has been brought about, the condition today in England is that her workmen do not do enough work in a day. English artisans, once the best in the world, no longer enable their employers to compete in world markets as once they could. The claim that the United States is drifting in the same direction is one put forth by too many sound thinkers to be ignored.

As a purely shop problem, it is vastly better to pay a certain sum to one man in order to have certain work done, than to pay that sum to two men to have the same work done. From a politico-economic standpoint it is equally desirable that the payment be made to one man. He can spend the money as well as two, thus keeping it in circulation, while the other man is free to seek gainful occupation elsewhere.

If a horizontal cut in wages is made in an industrial establishment, or in a whole trade, the tendency is for the workman to render reduced services for the reduced pay. A man is not a machine, and such a tendency cannot be wholly checked. If the less capable men are dismissed, the incentive is created for the remainder to increase their efforts, lest another curtailment of the working force catch them. There is thus produced a corrective influence to the slackness of effort which grows during every period of heavy demand for labor.

That horizontal cuts in wages are made in cases where a reduction in the number of men employed would accomplish the same results as to cost of production may be due less to a failure on the part of employers to recognize the soundness of this economic principle than to a desire to take care of the whole body of employes. There is more of such a desire on the part of employers to thus consider the welfare of their workmen than the latter generally give them credit for.

In the case of the office it is even more clear than in the case of the shop, that a reduction in the force is better economically than a reduction in salaries. It is a fact that here the principle is more generally carried into practice.

RE-ADJUSTMENT IN ALL METALS.

Iron and steel are not the only metals that have attracted unusual attention recently. In a broad way there is a sympathetic relationship among the various metals of commerce, and between various pairs there is even a reciprocal connection. This fact is well illustrated in the kinship of silver and tin, due mainly to the fact that silver is the money metal in the countries where tin is chiefly mined. But of course supply and demand command the rise and fall of all metals—even gold—as of other commodities. This latter, however, is a general condition rather than a relationship.

Copper, lead and spelter and also tin are associated, more or less closely, in a commercial sense, with iron and steel. It is not strange then that the readjustment, now taking place in the latter, should find a response in the former group. But the sympathetic current does not end here. It has been observed very clearly during the last week in the so-called minor metals, as antimony, mercury, nickel and even aluminum, though naturally the disturbance has been less as the trade connection has been more remote from the center of the initial trouble. Of course, each metal has its own peculiar trade affinities, in which the others do not share, except indirectly or very remotely. This independence is especially true of tin, which is the most erratic of metals, with whims and notions incidental to its Oriental origin—for we may ignore for the moment the little of this product mined in other regions.

As we pass from the crude metals to the finished products, such as machinery and electrical apparatus, in which various metals are assembled, the relationship is more closely knit.

The point brought especially to mind is that iron, less untrammeled than steel, has set the pace for all metals, once again sustaining the popular belief—as far as the metal group is concerned at least—that as iron goes, so goes the whole commercial and industrial world. Time is an important element to be considered. Such changes do not come suddenly, nor can the new levels be assumed in a day. The movement is wholesome, however, and there seems no probability of demoralization, as nearly all lines have been preparing for the turn of the tide.

LIMIT OF OUTPUT IN SHEET MILLS.

The Amalgamated Association of Iron, Steel and Tin Workers is now forced to face the most serious economic question with which it has ever had to deal. Embracing originally all the skilled crafts in iron and steel rolling mills, its scope has been gradually reduced until so far as steel is concerned it takes in little outside the rolling of ordinary steel sheets and black plates for tin plate. In these two lines it has retained a very considerable control, and its success has been very largely due to the fact that it has been generally known that it would be practically useless to urge it to make concessions from the tonnage wage rates in recognition of improvements in methods and machinery.

Partly from this fact there has been little incentive to make improvements, and methods of rolling sheets are essentially identical with those of a quarter of a century ago. The association has been aided very largely also by the fact that manufacturers of sheets and tin plates have operated on a comparatively limited scale, the country's total output being contributed to by a large number of competing establishments, none of which occupied an especially dominant position, so that there was lacking the force which broke the association's control in some of the large steel works.

Of late years the case has been different. The dominant sheet and tin plate interests invited no contest. They met the association in the fairest manner. Actuated by unwise counsels or something worse, the association invited a contest and emerged with greatly reduced prestige.

True to the principle we have enunciated in explaining the fact that the association has retained a good measure of control in sheets and tin plates when it has lost it in other branches of steel rolling, the position in sheets today is that it controls, with one exception, all the independent sheet manufacturers west of the mountains, while of the leading interest's mills it controls but a bare majority, and those not the best. Its consistent practice of limiting the output has fortuitously placed the independent manufacturers at a disadvantage with the dominant interest, particularly in slack times, when there is not enough business to keep all plants in operation, the orders naturally finding the mills where cost of production is least through heavier output per unit of plant.

With the urgent demand of the independent sheet steel manufacturers that the limit of output be removed, the Amalgamated Association is between Scylla and Charybdis. If it stoutly maintains the limit of output in the mills it controls, it throws work away from its own members; if it removes the limit of output it may throw more work to its members as a whole, but it reduces the number of its members engaged in producing a given tonnage. Nor it its path illuminated by the fact that whereas the dominant interest is usually anxious itself to have the limit of output removed, at a juncture like this it shows no such anxiety. The association must recognize that maintaining the limit of output has a tendency to strengthen that one of the sheet interests which operates a large number of non-union mills.

PERSONAL.

John Calder, who has resigned from the C. W. Hunt Co., of New York, as executive engineer, is now at Ilion, N. Y., where he will be connected with the Remington Typewriter Co. Before leaving New York the officers and employes of the company gathered around his desk to participate in the presentation of a handsome silver loving cup, suitably inscribed. George S. Humphrey presented the token to him, expressing the esteem in which he was held both professionally and personally by the donors.

J. C. Hobart, president of the Triumph Electric & Ice Machine Co., Cincinnati, has been elected president of the Business Men's Club of that city.

Albert N. Spencer has resigned from the position of second vice president of the J. A. Fay & Egan Co., of Cincinnati.

Herman Unzicker, representing the Allis-Chalmers Co., of Chicago, has gone to Mexico for the purpose of making a tour of the principal mining districts in the southern republic in the interests of the company.

The Sullivan Machinery Co., of Chicago, has appointed Hugh H. Cooley, until recently manager of the Spokane, Wash., branch of the company, special representative in Mexico City.

D. R. Mathias has been appointed general superintendent of the Joliet mills of the Illinois Steel Co. Mr. Mathias has been in the employ of that corporation for 18 years, and for the past year has been assistant superintendent of the Illinois Steel plant at South Chicago.

J. B. Clark, formerly superintendent of the Bessemer department of the Algoma Steel Co., at Sault Ste. Marie, Ont., has taken up the basic open-hearth practice. His present address is Depew, N. Y.

W. G. O'Malley, formerly of Scranton, has been promoted to the position of superintendent of shops at the Lackawanna Steel Co.'s plant, Buffalo. He has been with the company for some years, being formerly master mechanic at its South Works, at Scranton.

Manager Charles Hart, of the Republic Iron & Steel Co., at Youngstown, has appointed Thomas B. Aikin chief inspector of all the iron and steel turned out at the various plants of the corporation in Eastern Ohio and Western Pennsylvania. The position is new and is designed to insure the highest grade of goods.

F. S. Caldwell, formerly of Cincinnati, has accepted a position as foreman of the foundry department of the Union Steam Pump Co., Battle Creek, Mich.

W. H. Thayer, who has been in the foundry business at Atchison, Kan., for the past 20 years, has retired from business and turned the concern over to his son, W. A. Thayer.

Chas. Ashurst, who has had charge of the R. Hoe & Co.'s foundry, New York, for the past ten years, has resigned his position to take charge of the erection of a new foundry for Fuchs & Lang, printing press manufacturers, at Rutherford, N. J. Mr. Ashurst was presented a gold watch by employes of the Hoe Co.

The will of the late Gordon McKay, inventor of the McKay sewing machine, leaves 80 percent of the estate of many millions to provide for a new school of applied science at Harvard University.

The interests of Samuel E. Winslow, of Worcester, doing business as Winslow & Co., bankers and brokers, and the Samuel Winslow Skate Mfg. Co., of that city, all but two shares of which are owned by Col. Winslow, have been placed in the hands of receivers. The indebtedness of the Winslow interests is said to amount to $500,000.

The Labor Situation.

WAGES HAVE BEEN ADVANCED.

The Census Bureau has promulgated a report on wages of employes in manufacturing establishments in the United States. In the agricultural implement occupations, involving mainly the Central States, increases of wages in the period from 1890 to 1900 occurred with few exceptions. Rates in car shops fell. In the foundries and metal working industry there appears to have been little variation in rates, although in particular occupations there were changes of greater or less magnitude. Wages are highest in the Pacific and lowest in the Southern States. In this industry 28 different occupations are separately shown. Blacksmiths in the Middle States show considerable decrease.

The returns from iron and steel manufacture include blast furnaces, puddling furnaces, rolling mills, Bessemer converters and open-hearth furnaces. Owing to the prevalence of turn or tour duty in this industry, the rates given are for two weeks' work instead of a single week. In the Middle States the middle half were paid at rates from $15 to $27 in 1900 and from $15 to $28 in 1890 for the two weeks' work; in the Southern States the middle range at both periods is from $13 to $26, and in the Central States at both periods the rates are about the same, the middle half ranging from $21 to $30 in 1900 and from $21 to $31 in 1890.

BOYCOTT AND BLACKMAIL.

The Carborundum Co. at Niagara Falls, N. Y., some time ago were asked to discharge a machinist over 60 years of age who was competent and satisfactory to the company. The demand was based on the fact that this old man would not join the machinists' union, being a member of the Mennonite sect, and having religious scruples against taking any oath or obligation prescribed by any secret society. On the Carborundum Co.'s refusal of this demand, their machinists struck and were soon replaced by non-union men. The company has since been boycotted; a truly illuminating example!

Of course, the boycott is a strictly moral weapon—so we are asked to believe—but it frequently degenerates when worked on the weak or fearsome. A case in point is furnished by the Carborundum Co., under date of Oct. 30. They had just received notice from an agent that a certain customer who had used carborundum wheels with complete satisfaction for a considerable time, had been obliged to abandon their use, having been fined $5 by the Machinists' Union for every carborundum wheel used in the shop.

Think of it—that a boycotting blackmailer should "tap a till" on a pretext of that sort! And what does the poor man say? He says he either has to submit to the extortion or discontinue the use of the wheels, failing either, his business will be ruined. Were he a member of the National Metal Trades Association, he would, no doubt, have kicked the blackmailer into the street.

Evidently there is an incipient "Sam Parks" concealed about the Machinists' Union somewhere. If the boycott means that the Machinists' Union will refuse to be defiled by touching carborundum wheels under any circumstances, this extortion means that blackmail is cleansing, and that one lodge of the Machinists' Union can be bought for at least five dollars. Who gets the five?—[Bulletin of the National Metal Trades Association.

OPEN SHOP FAVORED.

The executive committee of the National Association of Agricultural Implement & Vehicle Manufacturers, in session at Chicago, Nov. 13, adopted the following unanimously:

"Resolved that, while we appreciate the rights of labor, we realize that the time has come when the manufacturer to be successful must select his employes in harmony with his individual judgment and existing conditions, regardless of whether said employes are or are not affiliated with any society or organization."

LABOR NOTES.

The employes of the Diamond State Steel Co., Wilmington, Del., will receive a cut in their wages beginning on Monday, Nov. 23. The whole working force will be affected. In the puddling department the men will receive a cut of 50 cents on the ton. Other workmen will be reduced on an average of about 2½ cents a ton. The salaried employes will receive about 10 percent less than at present.

The Chicago plant of the Manitowoc Shipyard & Drydock Co. has been sold to Theodore Nodson, and hereafter the company will operate only its Manitowoc yard. The removal from Chicago is said to be due to the constant labor troubles there.

As a consequence of an announcement in reduction of wages, the sheet mill employers of the Inland Steel Co., Indiana Harbor, Ind., went on a strike Nov. 14. The proposed reduction was from 10 to 20 percent in the wages of tonnage men, rollers, heaters, shearmen, machinists and laborers. The company states that it is compelled to take this course to meet competition.

The machinists' helpers at the Missouri, Kansas & Texas shops in Denison, Texas, and other shops along the line are on a strike for raise of wages.

The Reeves Boiler Works, Toledo, have signed the scale of the striking boiler workers, and the men have returned to work. The scale provides for a 10-hour day at 32 2-9 cents an hour.

Some of the striking molders at the plant of the Moline Elevator Co., Moline Ill., have returned to work. This is taken as a sign that the strike, which has so long been on at Moline, will soon be settled.

The 28-inch rolling mill and the blooming mill at the Pencoyd Iron Works, Philadelphia, are now closed. The company states that there has been no change in the plans, and that the closing down is now ended so far as present plans are concerned. The company has dispensed with the services of about 1,800 men within a few week, leaving about 1,200 in the machine shops and the foundries.

Notices have been posted in the Columbia Rolling Mill, Lancaster, Pa., announcing the reduction, effective Nov. 23, of the puddlers' wages from $4.50 to $4, and other workmen's wages in proportion.

A notice has been posted at the Warwick Furnace, Pottstown, Pa., announcing that the wages of employes will be reduced 15 cents per day. One hundred and thirty employes are affected. The reduction was effective Nov. 15.

The strike of the structural iron workers in New York and other cities against the Iron League has not assumed large proportions. The iron workers say that 1,200 men are out. Employers declare that only 150 have quit work. Some of the iron workers of the union, recognized by the employers, have deserted them, and have applied for membership in Local No. 2.

The American Sheet Steel Co. will cut the pay of tonnage men in the mills at Canal Dover, O., 20 percent Jan. 1. The men are not organized.

The Snell Mfg. Co., at Fiskdale, Mass., has shut down its plant indefinitely, forestalling an expected strike of the steel and iron workers of the company. The company makes bits and augers. The superintendent says that the company will not start up again until it finds men who will not dictate to the management who shall be employed and who shall not. The strike was anticipated because the president of the union was told to look for work elsewhere.

About 200 iron workers employed on additions to the plant of the East River Gas Co., Ravenswood, Long Island, and that of the Consolidated Gas Co., at Woolsey, have gone on a strike demanding more pay. The companies claim that the demands of the strikers are unreasonable and cannot be granted.

The places of the members of the International Association of Bridge and Structural Iron Workers who struck at Indianapolis, Nov. 13, were filled on the following day by the Brown-Ketcham Iron Works Co. with non-union men. The works will hereafter be "open shop."

The car wheel foundry of the Barney & Smith Car Co., of Dayton, O., has been closed.

LAKE SUPERIOR IRON MINES.

The Duluth, Missabe & Northern road is through shipping ore for the season, and the record of ore forwarded to Duluth to be shipped is 5,339,957 gross tons, as compared with 5,610,407 gross tons for the season of 1902, a decrease this season of 270,450 gross tons. In the subjoined comparative statement it will be noted that the Biwabik mine shipped only 10,772 tons this year, as compared with 623,128 tons last year, and it should be explained that the bulk of the Biwabik's ore went over the Duluth & Iron Range road this year, whereas the Missabe road last year handled the bulk of the tonnage. The Biwabik really shipped 850,000 tons in round numbers this year, so that the discrepancy in the following statement will be understood. Of the ore shipped there is still 33,425 tons in the docks in Duluth, and this will be moved out in a day or two. The shipment by mines follow:

Mines.	1903	1902
Adams	1,109,759	1,242,923
Spruce	507,032	543,397
Troy	10,267	.....
Duluth	7,405	150,220
Biwabik	10,722	623,128
St. Clair	6,148	.....
Burt	429,711	100,331
Day	111,009	106,516
Glen	171,705	23,875
Hull	432,916	423,266
Pittsburg	229,133	238,122
Rust	160,624	242,715
Sellers	251,631	193,428
Lincoln	279,632	87,779
Poole	200,029	.....
Mesaba Mt.	5,866	5,131
Mountain Iron	1,217,156	1,430,103
Etna	119,212	199,473
Totals	5,339,975	5,610,407

Obituary.

Alfred J. Redway, a prominent stove manufacturer of Cincinnati, died Nov. 13, aged 70 years. He was born in New York State, but had been a resident of Cincinnati since 1855. Later he formed the firm of Redway & Burton, which was engaged for many years in manufacturing stoves. He had made numerous inventions for the improvement of stoves.

Alexander M. Wilkie, of the firm of A. M. Wilkie & Co., furnace builders and general contractors, Pittsburg, and chairman of the Iron City Fire Brick Works, Ltd., died Monday morning, Nov. 16, at his home in Mount Washington, Pittsburg. He was born near Glasgow, Scotland, Nov. 11, 1850. For 15 years he was employed as superintendent for James P. Witherow, who until ten years ago operated the largest iron and steel engineering works in the country. In 1893 Mr. Wilkie organized the firm of A. M. Wilkie & Co., of which he was the head at the time of his death.

The Atha Steel Co., Newark, N. J., has laid off about 500 men on account of a lack of orders. This is the first time in six years that the concern has not been working full time. Much of the company's output was Government work for war vessels. The concern usually employs about 700 men. It is said that the present shutdown will last three weeks.

The Wellman-Seaver-Morgan Co., of Cleveland, has closed a contract with the John Cockerill Co., of Seraing, Belgium, for the exclusive right to manufacture and sell the Cockerill type of gas engine in the United States. These engines have been in successful use throughout Europe for a longer time than any other design of large unit gas engines, and the horsepower of this type in satisfactory and successful operation in Europe is larger than all other types of gas engines combined. This contract not only gives the exclusive right to make and sell, but also acquires all the drawings, plans and other information of the Cockerill Co. An especially valuable feature of the connection is the fact that the Cockerill Co. has blast furnace, steel works and rolling mills in combination with the engine building shop, and it is possible therefore to test every new type and modification of the engines in actual work before sending them out to customers. With the gas engines, the Wellman-Seaver-Morgan Co. is prepared to furnish complete installation of all the necessary accessories, such as cleaning, purifying and regulating apparatus. The Cleveland and Akron plants are admirably adapted for the manufacture of this class of work.

Receiver for Jenifer Furnace Co.

(Special Telegram.)

BIRMINGHAM, Ala., Nov. 17.—A receiver was appointed yesterday for the Jenifer Furnace Co., Jenifer, Ala. The company operates a coke furnace with 50,000 tons annual capacity. W. H. Weller is president; W. Aubrey Thomas, vice president and general manager; and Edward F. Niedecken, secretary.

N. & G. Taylor Co. Extension.

The N. & G. Taylor Co., of Philadelphia, is completing a number of improvements in the works at Philadelphia and at Cumberland, Md. These improvements, in the case of the former, consist of several new departments, including additional warehouses, storage rooms, box factory and blacksmith shop. The tin house is being enlarged to give increased lighting and ventilating facilities. At Cumberland the new open-hearth furnaces have been completed and are now running regularly, together with the recent installed gas producing equipment, consisting of four Forter-Miller producers in addition to the old producer capacity. A warehouse has been finished in the sheet steel department to provide for the increased business in blue annealed sheets, gauges 6 to 16, and new annealing furnaces are being built in the black plate department to supplement the works capacity for plates for tinning purposes. The firm has secured the contract for covering a number of the buildings at the Louisiana Purchase Exposition with the "Columbia" brand of tin.

Youngstown Iron, Steel & Tube Co.

George D. Wick, of Youngstown, when asked about the report regarding the Republic Iron & Steel Co. taking over the property of the Youngstown Iron, Sheet & Tube Co., said: "So far as I know no definite proposition has been made by either company. On a fair cash basis I believe it would be a good thing for both companies, but nothing of this kind could be accomplished with the present feeling about industrial stocks, unless done on an actual cash value for the property acquired."

A 20,000 Ton Expert Rail Order.

The Constantinople correspondent of the *Frankfurter Zeitung* telegraphs his paper that the Pennsylvania Steel Co. has been awarded the contract for 20,000 tons of steel rails for the Mecca railway, in competition with the Krupps and several other German and Belgian establishments. The price is $22.88, delivered at Beirut.

Unofficial reports of imports of iron and steel through New York and other Eastern seaboard ports last month show a decrease of nearly 85 percent when compared with similar imports in September. The October imports of pig iron amounted to 7,218 tons, 5,117 tons coming from Great Britain and 2,101 tons from Continental Europe.

According to special official reports to *Construction News*, permits were taken out in October in twenty-four of the principal cities of the country for 7,887 building improvements, aggregating a total consideration of $25,923,446 against 7,259 building improvements involving $25,553,138 for the same month a year ago, an increase of 628 buildings and $370,308 in cost.

The Cleveland Punch & Shear Works Co., of Cleveland, has appointed Jos. T. Ryerson & Son, of Chicago, its exclusive distributing agents.

Employes of the American Sheet Steel Co., at Muncie, Ind., have been officially notified that a resumption of the Midland steel mill is a remote possibility and have been advised to seek employment elsewhere. The Midland was shut down because of a shortage of orders.

EASTERN PENNSYLVANIA.

(Special Correspondence.)

HARRISBURG, Nov. 17.—Reductions of wages and of working hours have been the order of the last two weeks in this part of the State. Production has been curtailed by all of the big iron and steel companies east of the Alleghenies and next week more plants will close. Incorporation of new iron and steel companies has almost entirely ceased and several boards of trade in this section have failed to act on overtures made for establishment of works.

The Pennsylvania Steel Co. stopped two furnaces at Steelton this week and in the Lehigh Valley more stacks will close. The Thomas company is relining one Lock Ridge, but it is stated that there is slim prospects of its starting up very soon.

The event of most importance for the month was the award of the contract for the Blackwell's Island bridge to the Pennsylvania Steel Co. This bridge will take 41,000 net tons of steel, all of which will be made in this country.

Almost all of the works employing puddlers east of and in this city have cut the rate to $4 per ton from $4.50. If conditions do not improve another cut will be made.

The Lebanon chain works have been transferred to Eli Attwood, a former owner, by the Standard Chain Co., which has been operating them.

The Carpenter Steel Co., which operates the big plant at Reading, is reported in the hands of R. E. Jennings, receiver. The works are said to have much government work to do. Their improvements have been stopped.

The Pennsylvania Steel Co. has awarded the contract for two 250-horsepower engines for its Lebanon coke plant to the Harrisburg Foundry & Machine Works of this city.

The Pennsylvania Steel Co. has received the award of 20,000 tons of steel rails for the Mecca railroad, outbidding the German and other continental firms, the price being $22.88 at Beirut, Syria. The rails will probably be rolled at Sparrow's Point and Steelton.

The Duncansville mill of the United States Steel Corporation, near Altoona, has suspended indefinitely. It was a part of the American Steel Hoop Co., and had been operating on general work.

The Empire Steel & Iron Co. is relining another of its stacks in the Lehigh Valley. Its active list is small. There is talk of removal of one of the furnaces from Bellefonte because of the labor situation. The stack suspended a short time ago because of a strike.

The Susquehanna Iron & Steel Co. has started several of its rolling mills at Columbia. In the recent proceedings for a receivership its officers were given until Jan. 1 to demonstrate their ability to make money.

The Reading Iron Company has closed one of its Reading mills and the forge at Gibraltar.

A considerable reduction of force has taken place at the Pencoyd works of the American Bridge Co. Other concerns in the Schuylkill Valley, including the Phœnix, Reading and Brooke companies, have reduced forces and wages.

The old Seiberling property at Akron, O., known in recent years as the Empire Mower & Reaper Works, has been sold to citizens of Akron and several other cities, who, it is announced, will form a company to engage in the manufacture of cutlery.

President Thompson, of the Republic Iron & Steel Co., positively denies the newspaper rumor that the general offices of the company will be moved to Cleveland. He says the company has just leased new offices in Chicago for five years.

Wilkoff Bros., Youngstown, O., have purchased the plant of the Ohio Steel & Iron Specialty Co., at Cuyahoga Falls, O., for $25,375. The plant was appraised at $75,000. Wilkoff Bros. inform us that the report that the plant will be removed to Youngstown is without foundation. They will probably operate it at Youngstown, but have not fully decided.

The men employed at the Demmler plant of the American Tin Plate Co., McKeesport, Pa., have decided to return to work next Monday, and accept the reduction in wages, against which they went on a strike this week.

PLANS OF THE U. S. STEEL CORPORATION.

For several months officials of the United States Steel Corporation have given much of their time and thought to careful consideration of methods by which operating costs could be reduced. A vast amount of guessing has been done by newspapers as to the probable action of the corporation and in some instances ludicrous statements have been made as to the extent of salary reductions and other retrenchments. It is impossible at present to state definitely what will be done as to wages. Several official changes, more or less directly connected with the policy of retrenchment, are under consideration, and the probability of the retirement of several persons who have been prominent in corporation affairs or in subsidiary companies is discussed. Important official changes will no doubt come from the amalgamation of the American Tin Plate Co. and the American Sheet Steel Co. and the removal of headquarters to Pittsburg.

The American Steel & Wire Co. is enlarging its quarters in the Western Reserve building, Cleveland, so as to accommodate the employes of the accounting department who will remove from Chicago and Pittsburg to Cleveland. The company will soon occupy the fifth floor of that building as well as the fourth, which it has occupied for a number of years. No final announcement has been made as yet concerning the operating and general sales headquarters of this company, though it is expected the former will be in Cleveland.

It is announced that on Jan. 1 the Lorain Steel Co., Lorain, O., will pass under the management of the National Tube Co., and the manufacture of steel rails, now the main output, will be subordinated to the manufacture of tubing. The Lorain Steel Co. will continue to manufacture steel rails for street railroads, with headquarters at Philadelphia, to which city President Daniel Coolidge and Secretary-Treasurer Boyd will remove their offices. General Manager Suppes, of the Lorain Steel Co., will remain in charge of operations of the enlarged Lorain plants.

The property of the bankrupt New York Car Wheel Works, Buffalo, has been sold by the referee to Martin Carey, of the law firm of Bissell, Carey & Cook, Buffalo, the bid being $155,500. Mr. Carey declined to state for whom he purchased the property. Joseph Berry, of Detroit, put in a bid of $152,000. Samuel Joseph, president of the Continental Iron Co., bid $153,000.

The Dominion Iron & Steel Co., Sydney, N. B., discharged about 150 of its employes Nov. 16. Construction work in its departments is about completed. The blooming mill was put on a 12-hour shift Nov. 15, which necessitated the laying off of about 60 more men. Altogether about 250 men were laid off last week.

The Acme Harvester Co., Peoria, Ill., resumed operations Nov. 16. An order was received from South Africa which will necessitate the employing of 400 men three or four months. For three weeks necessary repairs will be made. The affairs of the embarrassed company are fast righting themselves.

The New Jersey Steel Co. and the New Jersey Steel Holding Co. are two new corporations which have recently come into existence under New Jersey charters. Three of the witnesses in the United States Shipbuilding Co., who were spoken of during the litigation as "dummy" directors, appear as incorporators of the two new companies. The capital of the New Jersey Steel Co. is given as $1,250,000, and that of the New Jersey Steel Holding Co., $725,000.

It is announced that the Aultman & Miller Buckeye Co. Akron, O., will start operations about Dec. 1, employing a large force of men.

The National Chainmakers' Association met at Columbus O., Nov. 12, and elected Chas. Wambaugh, Columbus, president and Robert McKay, Pittsburg, vice president.

The Kingsford Foundry & Machine Works, Oswego, N. Y., has received orders for pumps for shipment to South Africa, Japan and Australia.

National Founders' Association.

The report of the National Founders' Association convention at Washington, D. C., contained in our last issue, brought the proceedings down to the adjournment of the Wednesday forenoon session. The afternoon of Wednesday was given up to committee work, and on Wednesday evening the annual banquet was held; so that the real legislative work of the convention was concentrated in the sessions of Thursday forenoon and afternoon.

One who has attended the various conventions of the association in the past six years could not but be impressed with the cohesive power that had been acquired by the long association in the work, of many of the brightest minds in the foundry industry of the country. The association has been fortunate in the choice of its presidents, and the names of Pfahler, Gates, Letchworth, Hoyt, Sargent and Towne stand for yeoman work in a field which manufacturers have little cultivated, but one, as they are coming more and more to see, that calls for the best that is in them.

The Washington convention showed, as has every convention of the National Founders' Association, that men cannot see with the same eyes, in looking at these important questions that affect the conduct of their industrial operations. But with all the minor differences that arise as to the policy of such an association, there has been an educational work in progress through the years of the association's history—a gradual drawing together of the diverse elements. It is truth to say that at no time has the association been more united than it is today on the objects for which it was founded, namely: "(1) The adoption of a uniform basis for just and equitable dealings between the members and their employes, whereby the interests of both will be properly protected, and (2) the investigation and adjustment, by the proper officers of the association, of any question arising between the members and their employes."

ISAAC W. FRANK, PRESIDENT-ELECT.

Anti-Boycott Association.

At Thursday morning's session Daniel Davenport, of Bridgeport, Conn., representing the Anti-Boycott Association, was given an opportunity to speak of the work of that organization. He referred in some detail to the part it had taken at Chicago and at other places in combating the embargo placed by the labor unions on the shipment of goods from shops the unions had put under the ban, the aid of federal courts being invoked to restrain the boycott operations of the union, on the ground that they constituted interference with interstate commerce. At Danbury, Conn., the Anti-Boycott Association had instituted suits against the individual members of a boycotting union and had attached their property, with the result that they were glad to agree to the withdrawal of the boycott. The speaker aroused a lively interest on the part of the convention in the work of his association and in concluding won a burst of applause by urging his hearers, in all their labor contracts with this or that organization, and in all their conferences with unions on hours and wages and shop practice, not to forget to stand for the right of the individual to make his own contract and to sell his own labor on what terms he chose, dealing as an individual with an individual employer.

New York Agreement.

Some discussion was had at the Thursday afternoon session on the application of the New York agreement, which is now the basis of the association's conference relations with the Iron Molders' Union. No action resulted, however, and the status of the agreement thus remains unchanged.

A report of the committee on finance was presented at Thursday's session, and the discussion indicated a thorough appreciation on the part of the membership of the value of a large reserve fund as a practical aid to the maintenance of peace and the reduction of strikes to a minimum.

Report on Uniform Agreement.

Antonio C. Pessano, chairman of the committee on uniform agreement, presented at Thursday morning's session a report detailing the work of that committee, which in the past year has involved a number of conferences with representatives of the Iron Molders' Union. These had not resulted in any agreement, and yet this is a matter which the committee thinks may well continue to engage the thought and effort of the two organizations.

In connection with the reading of the correspondence he had had with the president of the Iron Molders' Union in reference to further conferences on the subject, Chairman Pessano gave some details of the various meetings held. The only definite agreement reached was embodied in the following resolution, to which both sides had assented at the Cincinnati meeting of the joint committees:

"Resolved that the wage clause of the national agreement in its application to the several districts of localities be subject to such differentials as may be naturally agreed to by local or national representatives of the two organizations."

The report of the committee was received and the committee continued. In the same connection the convention reaffirmed its action at the 1902 convention in favor of a uniform agreement.

Some time was given to the discussion of features which the members desired embodied in a national agreement. It was finally decided that the committee should correspond with the members and secure in writing their suggestions as to what the uniform agreement should contain.

Resolutions of Thanks.

The convention marked the termination of John R. Russel's connection with the association as its treasurer, the State Savings Bank of Detroit succeeding to that office. Mr. Russel has been one of the mainstays of the association, and has handled hundreds of thousands of dollars for it, doing an inconspicuous yet highly important work in a way that has won the admiration and gratitude of the entire membership.

A resolution was passed thanking him in the most cordial terms for his work and expressing the deep obligation the N. F. A. owes him for his faithfulness and devotion.

President Towne was the subject of a highly eulogistic resolution of thanks, which expressed deep regret for his illness, hopes for his speedy recovery and thanks for the intelligence and fidelity of his service in the past year.

John A. Penton, the retiring commissioner of the association, received an unmistakable evidence of the esteem of the membership and the valuation put upon his services through the nearly six years of the association's existence. Resolutions were unanimously passed reciting his untiring work, his loyal devotion and his great personal sacrifice.

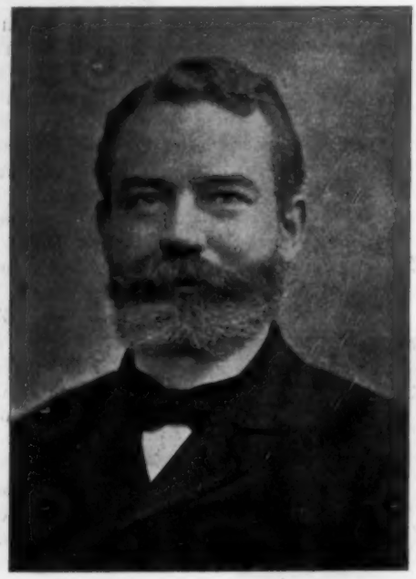
New Officers.

The final business of the Thursday afternoon session, which

followed the visit of the members to the White House to meet President Roosevelt, was the election of officers. The choice of the committee on nominations was ratified by the convention as follows:

President—Isaac W. Frank, United Engineering & Foundry Co., Pittsburg.

Vice President—Antonio C. Pessano, Great Lakes Engineering Works, Detroit.



ANTONIO C. PESSANO, VICE PRESIDENT.

Treasurer—State Savings Bank, Detroit, Mich.

Secretary—A. E. McClintock, Detroit.

First District Committee—H. A. Carpenter, A. Carpenter & Sons Foundry Co., Providence, R. I., chairman; Geo. H. Gibby, Condor Iron Foundry Co., Boston, vice chairman; F. B. Farnsworth, McLagon Foundry Co., New Haven, Conn.; P. D. Wanning, Birmingham Iron Foundry, Derby, Conn.; David Hunt Jr., Baush Machine Tool Co., Springfield, Mass.

Second District Committee—H. Van Atta, J. L. Mott Iron Works, New York, chairman; James McNaughton, American Locomotive Co., Schenectady, N. Y., vice chairman; R. C. Oliphant, Trenton Malleable Iron Co., Trenton, N. J.; F. E. Wheeler, International Heater Co., Utica, N. Y.; H. W. Wendt, Buffalo Forge Co., Buffalo, N. Y.

Third District Committee—W. S. Hallowell, Harrison Safety Boiler Works, Philadelphia, chairman; W. H. McFadden, Mackintosh, Hemphill & Co., Pittsburg, vice chairman; Howard Carlton, South Baltimore Foundry, Baltimore; B. J. Walker, Erie Malleable Iron Co., Erie, Pa.; John E. Harbster, Reading Hardware Co., Reading, Pa.

Fourth District Committee—J. D. Leary, Queen City Foundry Co., Cincinnati, chairman; W. D. Sayle, City Foundry Co., Cleveland, vice chairman; H. J. Boggis, Taylor & Boggis Foundry Co., Cleveland; C. H. Morgan, Morgan Engineering Co., Alliance, O.; H. C. Ryding, Lorain Foundry Co., Lorain, Ohio.

Fifth District Committee—H. K. McLean, Link Belt Machinery Co., Chicago, chairman; C. R. Stephens, Moline Plow Co., Moline, Ill., vice chairman; Ferd Schwedtmann, Magnetite Foundry Co., St. Louis; John L. Ketcham, Brown-Ketcham Iron Works, Indianapolis, Ind.; Robert Vierling, Vierling, McDowell & Co., Chicago.

Sixth District Committee—Irving H. Reynolds, Allis-Chalmers Co., Milwaukee, chairman; C. M. Power, St. Paul Foundry Co., St. Paul, vice chairman; T. J. Neacy, Filer & Stowell Co., Milwaukee; O. B. Kinnard, Kinnard-Haines Co., Minneapolis; H. M. Wallis, J. I. Case Plow Works, Racine, Wis.

Seventh District Committee—W. F. Angus, Montreal Steel Works, Montreal, chairman; Frederick Nicholls, Canada Foundry Co., Ltd., Toronto, vice chairman; Chas. H. Carrier, Carrier, Laine & Co., Levis, Que.; H. Cockshutt, Cockshutt Plow Co., Ltd., Brandford, Ont.; R. J. Whyte, Frost & Wood Co., Smith's Falls, Ont.

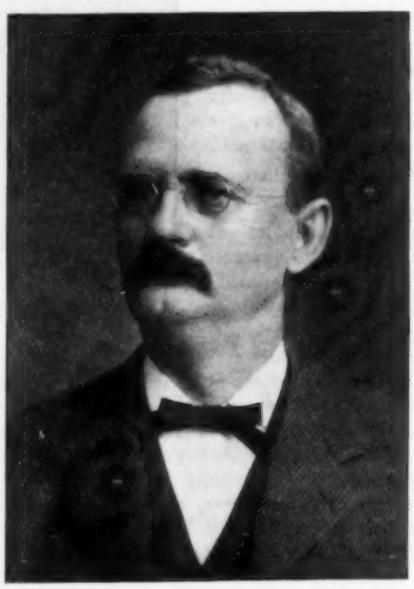
Eighth District Committee—E. Van Winkle, E. Van Winkle Gin & Machine Works, Atlanta, Ga., chairman; W. D. Tynes, Hardie-Tynes Foundry & Machine Co., Birmingham, Ala., vice chairman; A. D. Schofield, J. S. Schofield's Sons Co., Macon, Ga.; A. A. De Loach, De Loach Mill Mfg. Co., Atlanta, Ga.

The New President.

Isaac W. Frank, of Pittsburg, who was elected president to succeed F. T. Towne, of Stamford, Conn., has taken an active interest in the National Founders' Association since its organization, having been a member of the executive committee every year, last year vice president and for five years either chairman or vice chairman of the third district. The Frank-Kneeland Machine Co., of which he was president at the time of the organization of the association, is one of the charter members. Mr. Frank was born on Dec. 7, 1855, at Pittsburg, Pa. He was educated at the Rensselaer Polytechnic Institute, Troy, N. Y., and for four years was engaged in civil and mechanical engineering. In 1880 he became secretary and chief engineer of the Lewis Foundry & Machine Co., of Pittsburg, and in 1892 organized the Frank-Kneeland Machine Co., becoming its president. He continued to serve in this capacity until the organization of the United Engineering & Foundry Co., of Pittsburg, in 1901, when he was elected president, and continues to serve in this capacity. This company is a consolidation of the Frank-Kneeland Machine Co., McGill & Co., Lincoln Foundry Co., of Pittsburg, Pa., and the Lloyd Booth Co., of Youngstown, O., and the Chilled Roll Foundry Co., of Apollo Pa. Mr. Frank's other interests are extensive, and his acts of charity, bestowed with modesty, are legion.

The New Commissioner.

After the adjournment of the convention the new administrative council, which is composed of the officers of the association and the chairmen and vice chairmen of the various district committees, held a meeting and elected O. P. Briggs, of Minneapolis, Minn., as commissioner, to succeed John A. Penton. Mr. Briggs is a native of Livermore, Me., and received his education in the schools of Maine. He went to Minnesota in 1877 and took a position as clerk in the office of the Minnesota Iron Works, Minneapolis, which operated a jobbing machine shop and foundry, the plant being one of the first metal working establishments in the State. He remained with that concern and the Pray Mfg. Co., its successor, until 1886,



O. P. BRIGGS, THE NEW COMMISSIONER

when he started the Twin City Iron Works, for the manufacture of engines and power transmission machinery. The business continued under that name until the spring of 1902, when plans were made for the enlargement of the plant and for the entrance of new capital into the business. The name was changed to the Minneapolis Steel & Machinery Co., with J. L. Record as president, Geo. Gillette vice president, O. P. Briggs treasurer and Ralph Gillette secretary. The com-

pany employs 600 men and this year built a new machine shop, foundry, structural shop and wood-working department. It is capitalized at $750,000 and its lines of manufacture are Corliss engines, power transmission machinery, structural iron work and bridge and building construction.

Mr. Briggs' broad experience in manufacturing and shop management has well fitted him for the problems to be handled in his new office. He has actively participated in the work of the National Founders' Association as well as in that of the National Metal Trades Association and brings to the discharge of his duties the executive faculty as developed in the school of affairs. He will make his headquarters in the Hammond building, Detroit, in which the offices of the commissioner have been maintained heretofore.

Retirement of Commissioner Penton.

The Washington convention marked the end of one era in the history of the National Founders' Association, since with its adjournment Commissioner John A. Penton terminated his connection with the association. Mr. Penton has been the moving spirit of the association from its beginning. There have been able and wise leaders in the presidential chair throughout the six years, but Mr. Penton was the early propagandist of the association idea and went about the country enlisting foundrymen in the movement when skeptics were many and when men with the discernment and courage to ally themselves with an employers' organization for the working out of foundry labor problems were hard to find. Serving first as secretary of the American Foundymen's Association, which had done and is still doing a good work in substituting certainty for haphazard in foundry practice, Mr. Penton has become better known to the foundry trade of the United States than any other man, and his name has become linked with that trade in a peculiar way.

Some months ago he expressed a desire to be relieved from the arduous duties of the commissioner's office, and the administrative council, after finding that Mr. Penton's decision was unalterable, appointed a committee to find his successor. As a result of that committee's work O. P. Briggs, of Minneapolis, now takes up the work.

At a banquet of the official alumni of the organization—those who have served on the administrative council in any year—held at the New Willard hotel Tuesday night, Nov. 10, Mr. Penton's closest associates in the work of the past six years expressed their appreciation of what he has done. O. P. Letchworth, in behalf of the banqueters, presented Mr. Penton with a bound volume of letters from his friends. Each of these letters was mounted on parchment and contained an expression of appreciation of the recipient's service in behalf of the association. Mr. Letchworth at the same time gave Mr. Penton, on behalf of these friends, a diamond ring with three stones, accompanying the presentation with feeling words of thanks, of regret and of regard.

It was an occasion that told far more than words can express of the warmth and permanence of the friendships made and cemented in the burden and heat of the service rendered by the leaders of this association. It would be difficult to duplicate these relations in any organization doing similar work.

The Banquet.

The annual association banquet was given on Wednesday evening at the New Willard and there was the usual accompaniment of music, furnished on this occasion by an orchestra and a male quartette. The menu cards were unique, being in the form of a stock certificate. It certified that the bearer was "the owner of one first-class appetite, non-assessable, and 100 shares of the capital stock of the banquet of the National Founders' Association, at the New Willard Hotel, Washington, D. C., transferable only under the laws of nature and to be satisfied upon personal presentation, accompanied by a health certificate properly authenticated and recorded in the book of good fellowship. The certificates were signed by F. T. Towne, president, and A. E. McClintock, secretary, of the association, and bore the N. F. A. seal. On the back of the certificate was a group portrait of the six past presidents—W. H. Pfahler, P. W. Gates, O. P. Letchworth, H. W. Hoyt, W. D. Sargent and F. T. Towne—and underneath the legend, "The mildest manners with the bravest minds." The menu was interlarded with the terminology of the foundry and included among other things, fluor spar oysters, strained clay wash, gate pin asparagus with analysis sauce, and low silicon cheese. After the coffee "cupola stacks" were passed.

Stanley G. Flagg, of Philadelphia, as toastmaster, voiced the regret of all at the absence of the association's president and the first toast was drunk to the health of Mr. Towne, who was reported to be making a good recovery.

H. N. Covell was called on to express the association's appreciation of Mr. Towne's services and concluded his remarks by exhibiting a beautiful silver service of six pieces, with server—the gift of the membership to its retiring president. The service, which is the work of Gorham, is in French gray finish, and the art work, notably rich, following no conventional design. On the server is the inscription, "Presented to Frederick Tallmadge Towne, by the National Founders' Association, as a token of its appreciation of his services as president, 1902-1903."

The other banquet speakers were: E. F. Du Brul, commissioner of the National Metal Trades Association; Wm. H. Pfahler, of Philadelphia; O. P. Letchworth, of Buffalo; Geo. W. Cope, of the *Iron Age;* A. I. Findley, of *The Iron Trade Review;* J. H. Webster, of Cleveland; and the incoming president, Isaac W. Frank.

Mr. Letchworth referred to the developments at the Washington meeting as tending to prepare the association for a new campaign of usefulness and predicted that under such cooperation as the membership was capable of it would go on to greater strength and influence.

Mr. Pfahler presented, as he has so well done on many occasions, the obligation of employers to make some substantial contribution to a better status of the employer and employe problem. Friendliness between the employer and his men and a conciliatory spirit would go far toward improving present conditions. He deprecated any thought on the part of employers, now that a turn had come in the tide of business, of doing anything that would seem like getting even, or taking advantage of the necessities of their workmen. Liberty of action should be a foundation principle with employers' associations and they should always stand unalterably for the right of the individual to dispose of his labor when, where and how he pleases.

J. H. Webster, who followed Mr. Pfahler, emphasized the fact that for some time back employers had been concessors; they had yielded to unreasonable exactions under the stress of an unprecedented demand for their product. It was now time for the employer to be the concessee. But this meant no departure from the principles for which the association had always stood—rather a return to them. The law of supply and demand, which had operated against the employer's interest too often in the recent past was operative still; in the future it might lend itself to a larger extent to the purpose of associated employers. The right of the individual must not be overlooked in carrying forward the work of organizations, for the principle of individualism is still a foundation principle.

Mr. Frank, in bringing the speech-making to a close, emphasized the humane side of the work of the association. The movement, he said, was largely an educational one, and aimed to do much for the employe. The only line upon which success could be won was that of straightforward, upright conduct. The way to teach their men that a contract is a sacred obligation is for employers to keep their own obligations. The return to be got from reducing wages is very little worth striving for. The speaker believed in high wages and in encouraging workmen to give the largest output for the wage paid. Mr. Frank expressed the belief that, much as had been accomplished by the National Founders' Association, its work had only begun.

Notes.

E. F. Du Brul, commissioner, and Robert Wuest, secretary, of the National Metal Trades Association, attended the sessions of the convention. Thos. M. Roche, secretary of the Cleveland Founders' Association, was also present.

It was regretted that illness prevented Mr. Briggs, the newly elected commissioner of the association, from meeting all who attended the convention. Early in the first day's pro-

ceedings he was compelled to go to his room and his physician forbade any further participation in the work of the convention.

Those in Attendance.

The list of members attending the convention, with the firms represented, is as follows:

Isaac W. Frank, Vice President, United Engineering & Foundry Co., Pittsburg, Pa.
John R. Russel, Treasurer, Russel Wheel & Fdy. Co., Detroit, Mich.
W. F. Angus, Montreal Steel Works, Montreal, Quebec.
T. H. Benners, Birmingham Machine & Fdy. Co., Birmingham, Ala.
O. P. Briggs, Minneapolis Steel & Machinery Co., Minneapolis, Minn.
Willis Brown, Walker Foundry Co., Erie, Pa.
H. A. Carpenter, A. Carpenter & Sons Fdy. Co., Providence, R. I.
W. S. Hallowell, Harrison Safety Boiler Works, Philadelphia, Pa.
J. D. Leary, Queen City Foundry Co., Cincinnati, Ohio.
H. K. McLean, Link-Belt Machinery Co., Chicago, Ill.
Irving H. Reynolds, Allis-Chalmers Co., Milwaukee, Wis.
Wm. M. Taylor, Chandler & Taylor Co., Indianapolis, Ind.
R. D. Reed, H. B. Smith Co., Westfield, Mass.
H. VanAtta, J. L. Mott Iron Works, New York, N. Y.
J. H. Webster, Variety Iron Works Co., Cleveland, Ohio.
W. H. Pfahler, Abram Cox Stove Co., Philadelphia, Pa.
C. Bermingham, Canadian Locomotive Co., Kingston, Ontario.
E. A. Watson, Caldwell-Watson Fdy. & Mch. Co., Birmingham, Ala.
F. E. Wheeler, International Heater Co., Utica, N. Y.
Arthur A. Brown, Rarig Engineering Co., Columbus, Ohio.
Robert Vierling, Paxton & Vierling Iron Works, Omaha, Neb., and Vierling, McDowell & Co., Chicago, Ill.
O. P. Letchworth and J. C. Bradley, Pratt & Letchworth Co., Buffalo, N. Y.
Jos. A. Stone, Riverside Foundry Co., Cleveland, O.
C. H. Booth, Lloyd Booth Department, United Engineering & Foundry Co., Youngstown, O.
C. L. Newcomb, Deane Steam Pump Co. and International Steam Pump Co., Holyoke, Mass.
Frederick G. Evans, Mahoning Foundry & Machine Co., Youngstown, O.
Harry A. Boyd, Youngstown Engineering Co., Youngstown, O.
Carl Horix, Geo. B. Sennett Co., Youngstown, O.
G. A. Doeright, Falcon Bronze Co., Youngstown, O.
T. J. Neacy, Filer & Stowell Co., Milwaukee, Wis.
Jno. M. Taylor, Taylor-Forbes Co., and Crowe's Iron Works, Guelph, Ont.
H. W. Hoyt, Allis-Chalmers Co., Chicago.
P. W. Gates, Allis-Chalmers Co., Chicago.
F. D. Howard, Lamb Knitting Machine Co., Chicopee Falls, Mass.
R. J. Whyte, Frost & Wood Co., Ltd., Smith's Falls, Ont.
David Hunt Jr., Baush Machine Tool Co., Springfield, Mass.
A. J. Caldwell, Crane Co., Chicago.
F. H. Fairweather, M. E. Kennedy and John C. Judge, Kennedy Valve Mfg. Co., New York, N. Y.
F. T. Giblin, Giblin & Co., Utica, N. Y.
Chas. M. Jarvis, P. & F. Corbin Co., New Britain, Conn.
H. S. Hart, Russell & Erwin Mfg. Co., New Britain, Conn.
J. S. VanCleve, Erie Foundry Co., Erie, Pa.
Frederic Nicholls, and Geo. W. Watts, Canada Foundry Co., Toronto, Ont.
C. M. Power, St. Paul Foundry Co., St. Paul, Minn.
Geo. Q. Thornton, Carondelet Foundry Co., St. Louis.
M. H. Barker, American Tool & Machine Co., Boston.
W. H. McFadden, Mackintosh, Hemphill & Co., Pittsburg.
J. T. Speer, Pittsburg Valve, Foundry & Construction Co., Pittsburg.
Wm. Butterworth, Deere & Co., Moline, Ill.
Arthur E. Barlow, Newark, N. J.
John A. Rathbone, United States Heater Co., Detroit.
Samuel E. Hilles, Samuel C. Tatum Co., Cincinnati..
Theodore Bollmann, Bollmann-Wilson Foundry Co., Cincinnati.
Andrew N. Petersen, New York.
W. A. Taylor, Mallary & Taylor Iron Works, Macon, Ga.
B. J. Walker, Erie Malleable Iron Co., Erie, Pa.
H. W. Bullard, Poughkeepsie Foundry & Machine Co., Poughkeepsie, N. Y.
W. H. Shipler, Pennsylvania Engineering Works, New Castle, Pa.
Joseph Wright, Dominion Radiator Co., Toronto, Ont.
C. R. H. Cunningham, Chester Steel Casting Co., Chester, Pa.
John Grant, Valley Iron Works, St. Paul, Minn.
M. H. Murphy, American School Furniture Co., New York.
A. C. Pessano, Great Lakes Engineering Works, Detroit.
H. R. Luther, Barbour-Stockwell Co., Boston, Mass.
F. Macomb Cresson, George V. Cresson Co., Philadelphia.
Frank Fiebeger, Akron Foundry Co., Akron, O.
E. H. Walker, J. I. Case Threshing Machine Co., Racine, Wis.
William W. Wiard, Syracuse Chilled Plow Co., Syracuse, N. Y.
H. J. Boggis, Taylor & Boggis Foundry Co., Cleveland, Ohio.
W. W. Balkwill, Cleveland Steel Casting Co., Cleveland, Ohio.
J. S. Caffrey, Smith & Caffrey, Syracuse, N. Y.
M. J. Carroll, Carroll Foundry, Houghton, Mich.
John K. Gunn, Utica Pipe Foundry Co., Utica, N. Y.
J. S. Stirling, Samuel L. Moore & Sons Co., Elizabeth, N. J.
James E. Flynn, Flynn & Emrich Co., Baltimore, Md.
Samuel A. Kensil and Jacob B. Blankley, Tioga Foundry Co., Philadelphia.
E. B. Pierce, Wheeler Foundry Co., Worcester, Mass.
David Townsend, Eddystone Foundry & Machine Co., Philadelphia.
James Eastwood, Benjamin Eastwood Co., Patterson, N. J.
Edward Maher, Maher & Flockhart, Newark, N. J.
George S. Rominger, Girard Iron Works, Philadelphia.
E. N. Sperry, Monumental Bronze Co., Bridgeport, Conn.
John J. Riley, Brooklyn, N. Y.
F. D. Wanning, Birmingham Iron Foundry, Derby, Conn.
H. T. Hornsby, United Iron Works Co., Springfield, Mo.
H. B. Goodrich, J. A. & P. E. Dutcher Co., Milwaukee, Wis.
Gen. Edward Jones, Jones of Binghamton, Binghamton, N. Y.
Oliver Crosby, American Hoist & Derrick Co., St. Paul, Minn.
Ellis L. Rowe, Rensselaer Mfg. Co., Troy, N. Y.
C. R. Stephens, Moline Plow Co., Moline, Ill.
Chas. A. Barnard, Barnard & Leas Mfg. Co., Moline, Ill.
E. E. Durant, G. F. Warner Mfg. Co., New Haven, Conn.
F. B. Farnsworth, McLagon Foundry Co., New Haven, Conn.
C. E. White, Deere & Mansur Co., Moline, Ill.
Wm. C. Doherty, Doherty Bros., Lowell, Mass.
James F. Lannigan, Davis Foundry Co., Lawrence, Mass.
J. B. Sargent, Sargent & Co., New Haven, Conn.
Thos. Devlin, Thos. Devlin Mfg. Co., Philadelphia.
Fred. G. Scholfield, Kabley Fdy. Co., Worcester, Mass.
F. A. Strong and B. F. Lyon, Eaton, Cole & Burnham Co., Bridgeport, Conn.
Fred. F. Stockwell, Barbour-Stockwell Co., Boston.
H. A. Illman, James Barker, Philadelphia.
C. S. Bonsall, Buckeye Engine Co., Salem, O.
R. M. Bertram, Bertram Engine Works, Toronto, Ont.
Lyman P. Hubbell, Fillmore Ave. Foundry & Iron Works, Buffalo, N. Y.
Wm. Yagle, Yagle Foundry & Machine Co., Pittsburg.
W. D. Sayle, City Foundry Co., Cleveland, O.
Henry F. Arnold, American Tool & Machine Co., Boston.
E. L. Munson, Munson Bros. Co., Utica, N. Y.
J. F. Blauvelt, New England Butt Co., Providence, R. I.
A. H. Bullard, Bullard Machine Tool Co., Bridgeport, Conn.
D. J. Kilby, Kilby Mfg. Co., Cleveland, O.
Thos. H. Savery, The Pusey & Jones Co., Wilmington, Del.
George T. Brown, The Brown Cotton Gin Co., New London, Conn.
Jno. E. McIntosh, McIntosh-Seymour Co., Auburn, N. Y.
R. J. Cleveland, Cleveland & Barr Foundry Co., Chicago.
Wm. J. Michel, Tarrant Foundry Co., Chicago.
Alex. Jarecki, Jarecki Mfg. Co., Erie, Pa.
Will B. Greene, Palmers & DeMooy Fdy. Co., Cleveland.
C. W. Davenport, National Foundry Co., Erie, Pa.
C. C. Smith, Union Steel Casting Co., Pittsburg, Pa.
G. E. Emmons, Edison General Electric Co., Schenectady, N. Y.
Edgar McDougall, John McDougall Caledonian Iron Works Co., Montreal, Que.
E. L. Dawes and J. F. Whitehead, Standard Sanitary Mfg. Co., Pittsburg.
W. J. Carlin, Thos. Carlin's Sons Co., Allegheny, Pa.
Robert Taylor, Taylor, Wilson & Co., Allegheny, Pa.
T. L. Greenwald, I. & E. Greenwald Co., Cincinnati, O.
Geo. Rollings, Pittsburgh Malleable Iron Co., Pittsburg.
V. M. Moore, Chisholm & Moore Mfg. Co., Cleveland, Ohio.
Oliver Phelps, Lorain Foundry Co., Lorain, O.
James McNaughton, American Locomotive Co., Schenectady, N. Y.
Omar N. Steele, American Ship Building Co., Cleveland, O.
H. N. Covell, Lidgerwood Mfg. Co., Brooklyn, N. Y.
John H. Ricketson, Jr., A. Garrison Foundry Co., Pittsburg.
Thos. E. Durban, Erie City Iron Works, Erie, Pa.
E. G. Rippel, Buffalo Foundry Co., Buffalo, N. Y.
W. L. Herendeen, Herendeen Mfg. Co., Geneva, N. Y.
S. S. Gould, Gould Mfg. Co., Seneca Falls, N. Y.
J. W. Gardner, Gardner Governor Co., Quincy, Ill.
W. Strangward, Forest City Foundry & Manufacturing Co., Cleveland.
Walter Perry and G. W. Osborn, Farrel Foundry & Machine Co., Ansonia, Conn.
W. H. Morgan, Morgan Engineering Co., Alliance, O.
Patrick Kennedy, Kennedy Foundry, Baltimore.
G. T. Marsh, South Baltimore Steel Car & Fdy. Co., Baltimore.
S. H. Chapman and Owen Lloyd, Ontario Wind Engine & Pump Co., Toronto, Ont.
Exile Burkitt, Southern Engine & Boiler Works, Jackson, Tenn.
Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia.
Justis H. Schwacke, Wm. Sellers Co., Philadelphia.
A. O. Beatty, M. Beatty & Sons, Welland, Ont.
John W. Logan, Logan Mfg. Co., Phoenixville, Pa.
H. C. Francis, Creswell & Waters Co., Philadelphia.
W. H. Shelmire, Jr., Creswell & Waters Co., Philadelphia.
W. J. Phillips, Phillips & McLaren, Pittsburg.
H. E. Pridmore, and D. F. Pridmore, Henry E. Pridmore, Chicago.
Ward W. Willits, Adams & Westlake Co., Chicago.
Richard C. Oliphant, Trenton Malleable Iron Co., Trenton, N. J.
R. E. Kingsbury, Morgan Construction Co., Worcester, Mass.
J. J. Harty, Canadian General Electric Co., Kingston, Ont.
C. D. Marr, Fremont Foundry & Machine Co., Fremont, Neb.
M. Benjamin, Atlanta Machine Works, Atlanta, Ga.
D. Lewis Bartlett, Bartlett, Hayward & Co., Baltimore.
Thomas Evans, Eynon-Evans Mfg. Co., Philadelphia.
George A. Farrall, The Johnston Harvester Co., Batavia, N. Y.
H. R. Robinson, Robinson & Co., Richmond, Ind.
C. F. McGilvray, and H. E. Myers, The Robbins & Myers Co., Springfield, O.
Caleb Cresson Jr., Geo. V. Cresson Co., Philadelphia.
T. W. Fry, Sullivan Machinery Co., Claremont, N. H.
E. A. Merrill, McIntosh, Seymour & Co., Auburn, N. Y.
D. F. O'Neil, Western Foundry Co., Chicago.
J. R. Ketcham, Brown-Ketcham Iron Works, Indianapolis, Ind.
G. J. Feiss, Superior Fdy. Co., Cleveland.
H. L. Ide, A. L. Ide & Sons, Springfield, Ill.
Alfred T. Green, Vulcan Works, Chester, Pa.
G. Bartol, Otis Steel Co., Cleveland.
R. H. North, North Bros. Mfg. Co., Philadelphia.
H. Carlton, South Baltimore Steel Car & Fdy. Co., Baltimore.
J. G. Robertson, A. L. Ide & Sons, Springfield, Ill.

BULLARD BORING AND TURNING MILL.

The new pattern of the Bullard 42-inch boring and turning mill has one fixed turret head and one swivel head. Two swivel heads can be supplied if required, but the machine is regularly made in the form shown. The machine has side drive, which permits of constant or variable speed motor being applied at any time in the most economical manner.

The cross-rail heads are power operated by driving the vertical feed rods at a high constant speed from the overhead shaft, and at a variable speed through an independent feed box on the bed at the lower end of the rods. Levers C or D which are movable in both directions from the normal position (as shown by cut), operate a clutch mechanism of the expansion type in the bevel gears of the overhead bracket, giving the vertical rods a movement in either direction as required, and driving the cross-rail heads through the regular feed brackets on the back of the rail. When the lever is in the normal position, the overhead clutches are disengaged and the feed works of the lower brackets are automatically engaged with the vertical rods. The crossrail heads are thus traversed at a speed approximating 10 feet per minute, which can be modified if same is thought advisable. This construction makes it absolutely impossible for the quick traverse device to become engaged at the same time as the feed mechanism and obviates the necessity of the operator disengaging the feed works before opening the quick traverse.

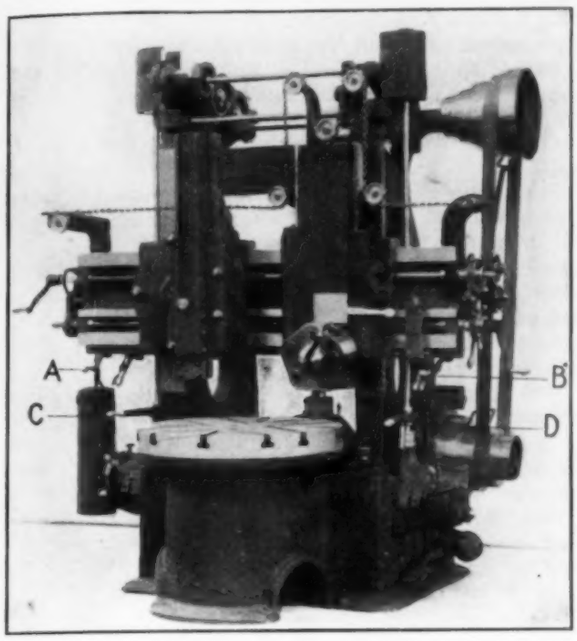


FIG. 1.—BULLARD 42-INCH BORING AND TURNING MILL.

As an illustration of the value of the above feature, let us assume that a gear blank is being turned and requires facing of both rim and hub; the feed having been engaged for facing the rim, then the quick traverse can be engaged with one movement of the lever, passing over the intervening space, between the rim and the hub, at the rate of 10 feet per minute. Upon releasing the handle, the feed immediately becomes engaged and the operation is completed. This convenience is also applied to the vertical and angular feeds and has a great influence on the productive capacity of the machine.

The feeds are positive, having ten changes ranging from 1-32 of an inch to ¾ of an inch horizontally, and from 1-50 of an inch to ½ of an inch in angular and vertical directions. In the crossrail bracket on each head the feed is engaged and disengaged by a toggle friction, operated by levers A or B, which serves a double purpose, in that it gives a quick means of engaging and disengaging the feed, and also answers the purpose of a safety device to prevent accident in case of the heads being run together by the quick traverse of feed mechanisms.

The right-hand head is screw cutting and has screw cutting gears entirely independent of the feed gears; feeds being engaged by the toggle friction clutch above mentioned. The reverse movement of lever A engages the screw cutting gears by means of a positive clutch, so that it is possible to bore a hole with as fine feed as required and, without changing any gears, immediately chase the hole with the coarsest thread for which the machine is geared. The turret head is arranged for cutting all standard threads from 2½ to 12 per inch.

The design of the crossrail, Fig. 3, is an illustration of the attention that has been paid to the apparently minor details which however materially assist in securing increased production and ability to maintain alignment regardless of the severity of duty required of the machine. The length of the bearing surfaces of the saddle on the rail has been increased, and the width narrowed; the horizontal alignment being obtained on surfaces A and B with the screw located as near central as possible. The saddle is gibbed back against the rail, receiving its thrust on surface D. The saddle does not bear on surface E but is gibbed between surfaces F and G. It will also be noted that the saddle is of the square locked type, having no loose joints; taper steel gibs being used for taking up adjustment. This type of bearing is also employed for maintaining alignment of the crossrail with the right-hand upright, the left-hand upright merely acting as a support.

The high-speed journals are all of the ring oiling type and have bronze bushings; oil being carried through the bearings by means of spiral grooves cut on the shaft, both right and left hand. The belt shifter, as shown, enables operator to shift the cone pulley belt from one step to the other very expeditiously and without injury to his hands. This can be done with the machine under full load. The foot brake, shown at the right-hand side of the machine, Fig. 1, applies directly to the large step of the lower cone pulley and brings the table to a stop at any predetermined point for tightening chuck jaws or for truing up work. If this device was not employed, the time consumed in coming to a stop would often be quite objectionable. The headstock gears are entirely incased and run in an oil bath, which insures ample lubrication and quiet running.

The counterweighting of the heads is accomplished by passing the chain back of the center, so as not to interfere with any tackle which may be employed for loading work on the table.

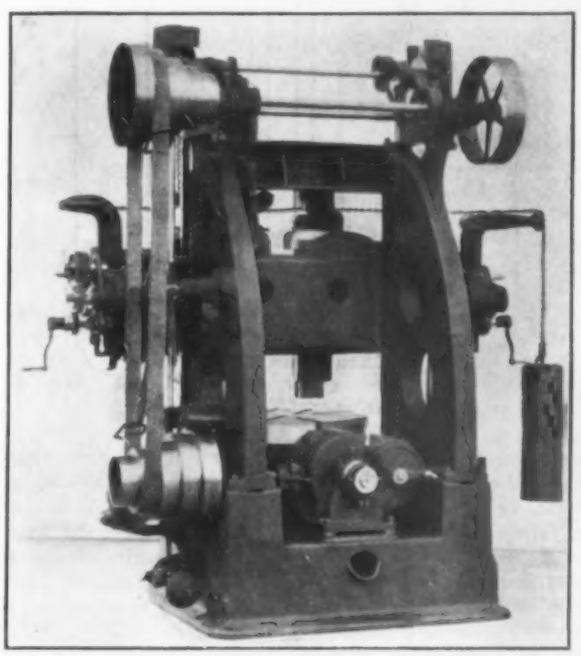


FIG. 2.—REAR VIEW OF 42-INCH BORING AND TURNING MILL.

As turret tools of considerable weight are likely to be used in the right-hand head small weights are provided for increasing or decreasing the counterbalance.

The table spindle is of the regular Bullard type, a vertical thrust being taken on the angular bearing, 24 inches in diameter, which is entirely immersed in oil. The table has parallel slots for receiving the new Bullard spiral chuck jaws, but combination chuck can be fitted if required.

The weight of this machine is 14,300 pounds net, and the material has been so placed as to give a high degree of rigidity. It is the custom of the manufacturers, the Bullard Machine Tool Co., of Bridgeport, Conn., to supply a 7½-h. p. motor for the machine but for the majority of work a 5-h. p. motor is sufficient. The machine can be equipped as shown in Fig. 2 with a variable or constant speed motor.

Foreign Trade of Japan.

The *Anglo-Japanese Gazette* of September, 1903, published in London, England, says, relative to Japan's foreign trade as shown by statistics for the six months ended June 30, 1903:

"While it may have been the case that for some years the exports of British merchandise exceeded those of the United States, the energy and enterprise displayed by American firms and their mode of promoting trade with foreign countries has, however, been successful at length in placing that country's exports to Japan ahead of those of Great Britain. Taking the figures of exports from the United States to Japan for last year, as compared with those of 1901, an increase of 13 per cent is shown, while on the other hand Japanese imports from Europe show a falling off. In 1881 the United States furnished 5.72 percent and last year 17.9 percent of the total imports, as compared with Great Britain's share of 52.57 percent in 1881 and 18.53 in 1902.

"Japan imports large quantities of machinery of every description—railroad plant, vehicles, labor-saving tools—from the United States. Referring to this subject in a previous issue, we pointed out as a reason for the decline of British exports to Japan that hitherto Great Britain has been too proud of the fact that her goods can not be beaten in value, forgetting that there are more ways than one of securing business, and also that human nature is very easily duped by an appeal to the pocket and appearance. Japan's enterprise and desire to obtain the most efficient and quickest machinery and appliances have drawn down upon her increased competition on the part of manufacturing nations. It was also shown that American machinery firms commenced by selling their goods at any price, reaping the reward in growing quantities and an ultimate sure place in the market."

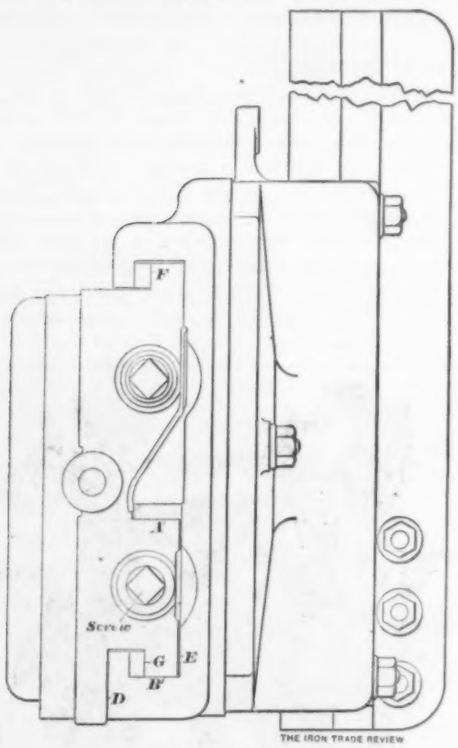


FIG. 3.—END ELEVATION OF CROSS RAIL.

The Vulcan Iron Works, Toledo, O., shut down Nov. 14 for an indefinite time on account of shortage of orders, and a strike in one of the departments. About 100 men are thrown out of employment.

HOW SHALL WE IMPROVE TRADE?*

BY W. P. DAVIS.

There are many ways by which we may improve trade, and while there may be nothing new in what I have to say on the subject, I trust it will at least give food for thought, which, if followed out, may be of mutual benefit.

For the past three years, all machine tool builders who are building a good class of machines have had all they could do, and in many cases more orders than they could fill. The result has been many new manufacturing plants have sprung up and all of the old firms have enlarged and increased their output until at the present time we can supply all the local demands and yet have a reserve capacity to fill foreign orders.

Our own country is growing rapidly, as we all know, yet unless we have some export business, we cannot expect to continue to run full time with our present capacity and market our products in our own country. There is no doubt that the present slump in the sale of machine tools is due largely to the labor troubles which, with their unreasonable demands, are holding up all kinds of business in all parts of the country, and which, if continued for any length of time, are going to bring on great loss and suffering.

The country is not in a condition that a financial panic should be expected. If the labor troubles are settled soon, it is reasonable to expect a fair amount of business will be done for the next few years; yet no one should expect the volume of business that we have had for the past three years. We should begin to look for other markets than our own, and the question then arises, "where shall we find the market?"

In the last few years we have found a large sale for our tools in foreign countries, but we must all admit there has been a great falling off in orders from abroad, and for many years, at least, we cannot expect as large a sale for our products as in the past.

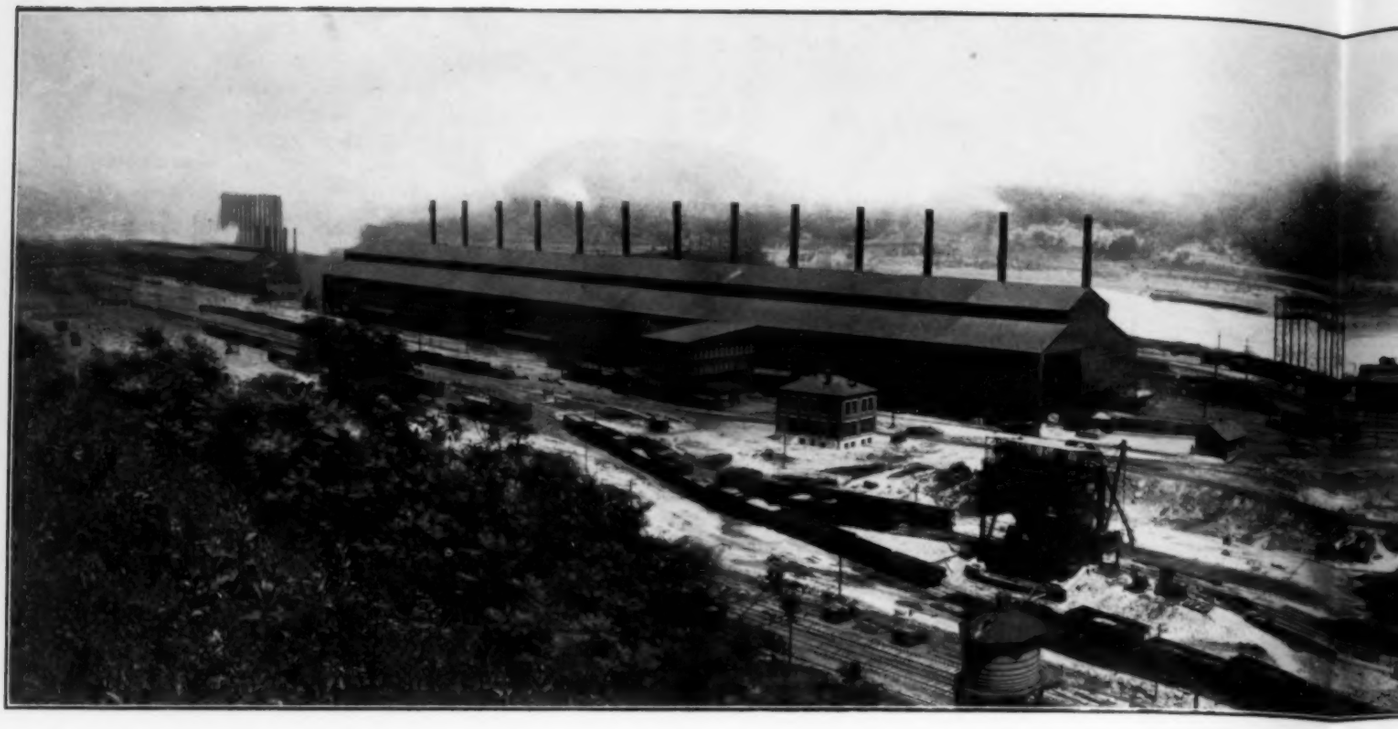
The past summer I have traveled through the various countries of Europe to which we look for trade, and have made a careful study of the conditions and prospects. If there are any among you who have an idea that the Yankee is the only one who can copy and profit by what he sees, you should travel through Italy, Germany and England and see the shops that have been supplied with modern American machines which have in many cases been copied, and in some cases changed to suit their demands. With labor far below the cost of our own, they are making tools that are so low in price that we cannot compete if they should adopt our system of manufacture.

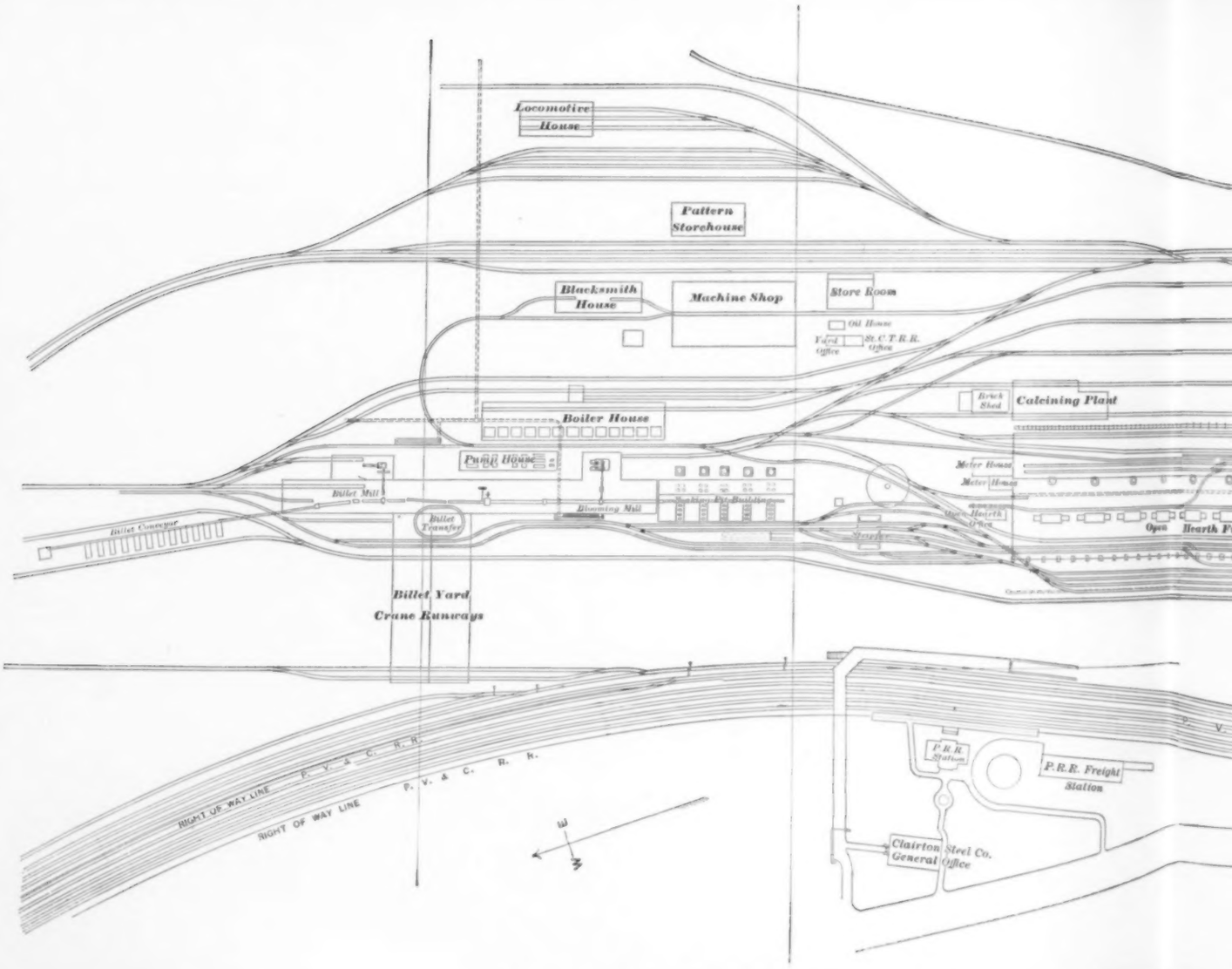
We have, however, one great advantage over them, which is the fact that we manufacture in large numbers, while they manufacture a large variety. In one large shop in Italy, where 2,500 men are employed, I found them building locomotives, passenger and freight cars, threshing engines and machines, and a variety of small machines as well; and in one department they were even making twist drills. So long as they build such a large variety of work in one shop, they cannot produce any one of the various lines as cheaply as we can where we make a specialty of one line.

We have most to fear from Germany. Here I found a large number of manufacturing plants going up, and they were of a substantial kind, being well built and of modern design, with all of the latest improved machinery. With their improved plants and cheap labor and the enterprise and push of the German people, they are going to make us earn all the trade we get wherever they market their machinery.

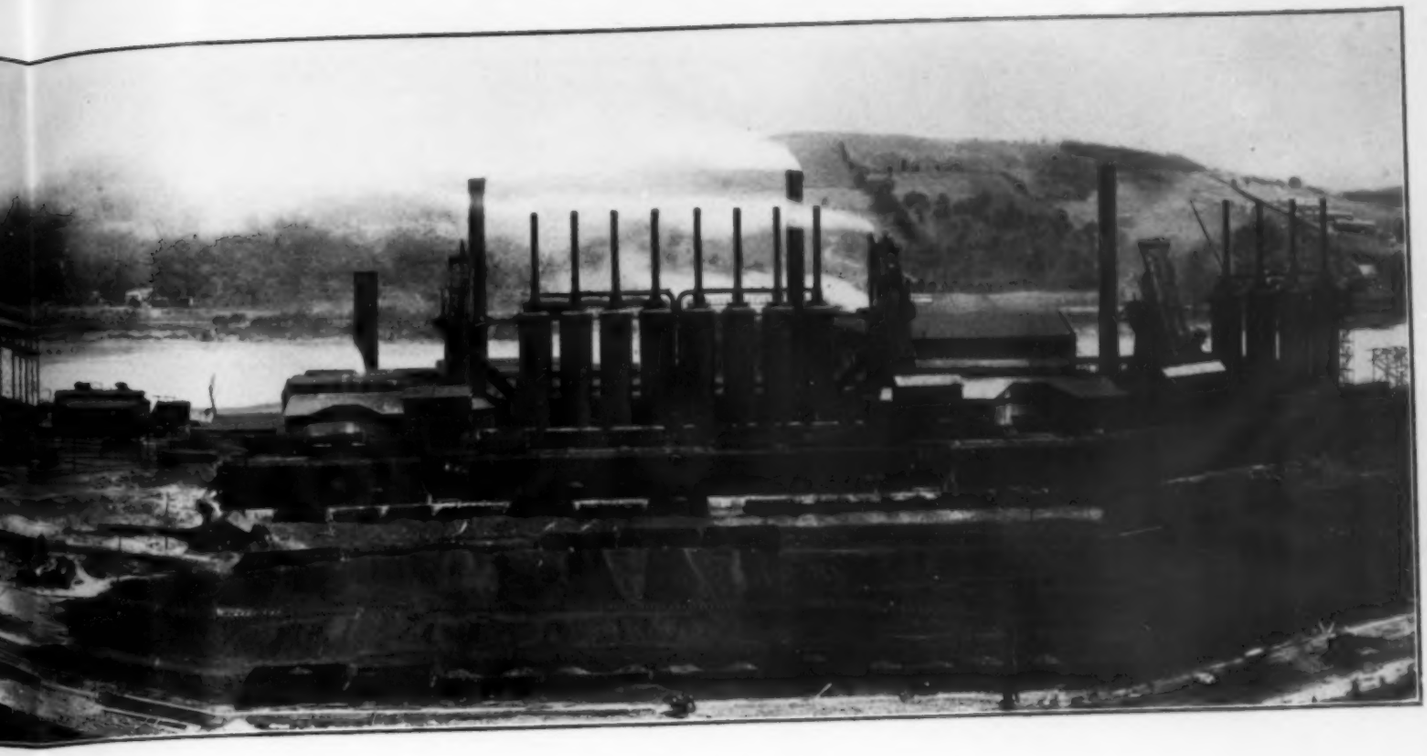
In many parts of England, they are far behind the times in putting in improved machinery, and many seem to think the methods used by their fathers are good enough. So long as they cling to this idea, we can compete with our English cousins and get our share of the trade. I believe there is more chance to get American tools in

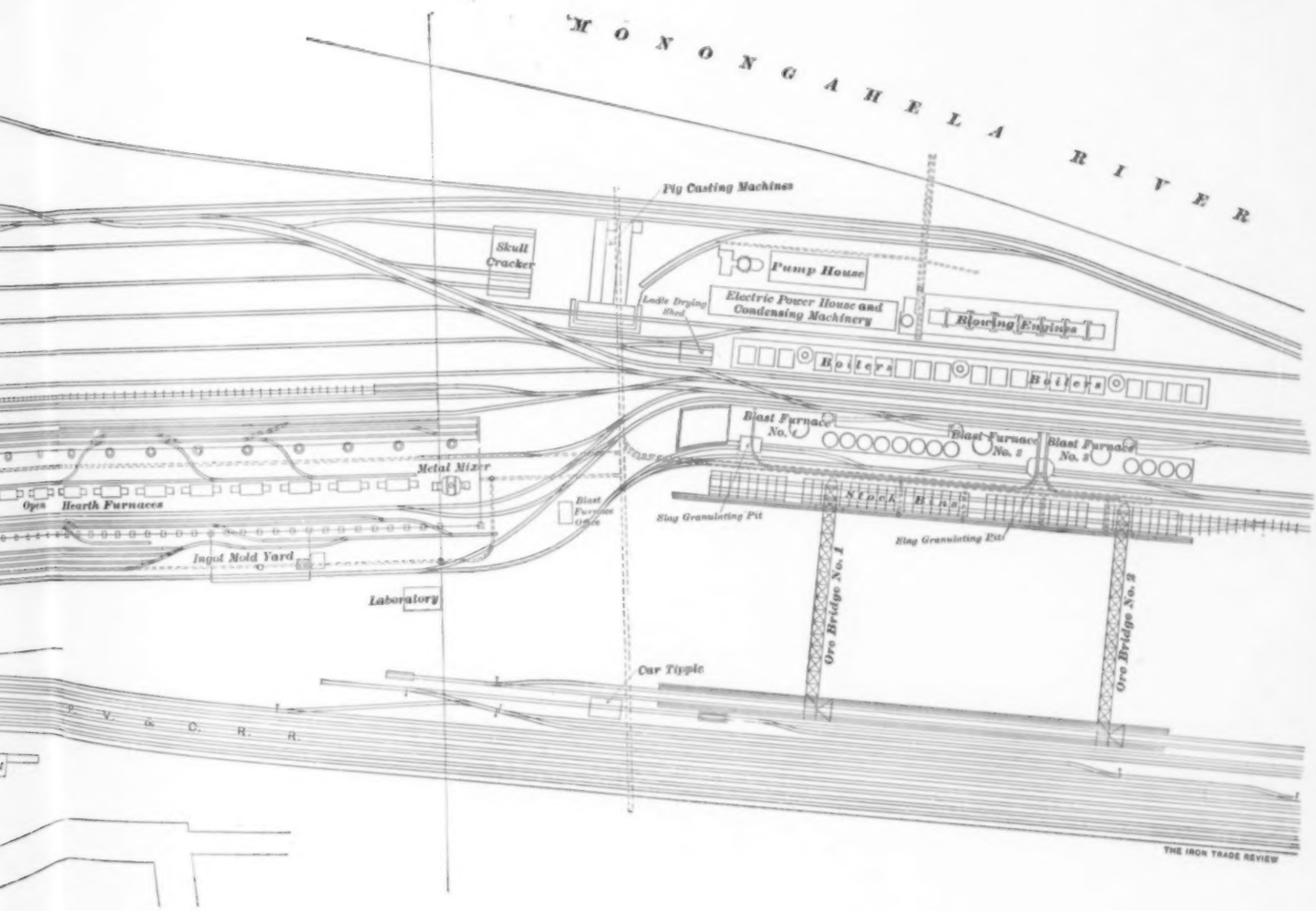
*Read at New York meeting National Machine Tool Builders' Association, Nov. 10-11.





FIGS. 1 AND 2.—PANORAMIC AND PLAIN VIEWS OF THE WORKS





THE WORKS OF THE CLAIRTON STEEL CO. AT CLAIRTON, PA.

England than in any foreign country I visited, if we take the time to visit the shops and introduce and show them, by actual use, just what our tools will do. I have a kind word for the machine dealers of England. They are doing a good work, and are fairly up to date in methods and push. They carry a large stock. We all know that in order to sell a large quantity of machinery, it is necessary to have a representative line to display.

As London is a great distributing center, it is necessary to have our machines represented and carried in stock by some one of the leading machinery dealers. There are many of our tools that have not been properly shown up, or they would be in more general use.

We must admit that in the past six months there has been a great falling off in the sale of machine tools, but I see nothing alarming about the situation. We should trim our sails according to the breeze. Instead of manufacturing large stocks and then attempting to go on to the market and sell them at reduced prices, we should be reasonable and treat the conditions as we find them. Instead of keeping a large number of men at work, we should reduce our working force in proportion to the amount of business we are securing. If we find, on looking over the situation, we can keep about the usual number of men by working less hours per day, this is a matter that should be considered, as it would be far better for the working man if the hours were reduced and they were all kept at work.

We must also take advantage of the present depression to improve our plants, introducing new methods and making such changes as we may find necessary in the design and construction of our machines; and also devise the most improved methods of turning out our work and use good judgment in maintaining prices until business improves. None of us can afford to sell our machines at the present time at a lower price. Nothing can be gained by cutting prices. It would not only mean a loss to us, but to all of the machinery dealers as well, who, as we well know, are carrying, in nearly all cases, a larger stock than they can really afford to. In a few months at most, we have every reason to expect better conditions in business. The country was never in a more prosperous condition. When certain changes have been brought about, I have every reason to believe we may all look for a fair amount of business, but we should not expect to see the order book crowded as in the past few years.

In closing, I will ask you one and all to stand by our association. It has helped us in the past, although we have only been organized a few months, and it will help us more in the years to come. All we need is more members and more confidence in each other, for if we are loyal and work for the interests of the association, it is bound to bring good results to us all.

Giant Locomotives.

A new locomotive, one of the largest in the world, has just arrived at the Western terminal of the Santa Fe road in Southern California, the first of forty-five giant locomotives to be used to haul freight trains over the steep grades on that company's lines. The new engine weighs over 143½ tons with drivers fifty-seven inches in diameter.

The Lima Locomotive and Machine Works, Lima, O., have just completed and thoroughly tested a locomotive which has a traction power of 67,000 pounds. The following are the dimensions of the engine: Three cylinders 17 by 18, four trucks, sixteen drivers 40 inches in diameter, boiler 62 inches, extended wagon-top; grate area, 42¾ square feet; total heating surface, 2,498 square feet; working pressure 200 pounds; tank capacity, 8,000 gallons; coal capacity, 9 tons; rigid wheel base, 58 inches; total wheel base, 57.10 inches; length over all 720 inches; will travel around curves of 125 feet radius; traction power, 67,000 pounds; weight in working order, 300,000 pounds.

The plant of the Southern Car & Foundry Co., Anniston, Ala., resumed operations Nov. 16. It is said that orders for several hundred cars have been received.

AMERICAN BOILER MANUFACTURERS' ASSOCIATION.

At the meeting of the American Boiler Manufacturers' Association in Chattanooga last week, the labor question was discussed at length and it was decided to address a letter to manufacturers, asking their co-operation, especially in promoting conciliatory measures and in opposing sympathetic strikes.

Col. E. D. Meier, chairman of the committee on revision of boiler inspection laws, made an extended report. The work of boiler inspectors was severely criticised. It was decided to continue the committee and appeal to Congress to amend the boiler inspection laws.

Other subjects discussed were the following:

"Abatement of the smoke nuisance."

"Have the American Boiler Manufacturers' Association and the Hartford Insurance Company combined improved the quality of steel, plate, rivets and boiler tubes used in the construction of boilers at this time?"

"What means should be used by this association to increase the quality of boiler tubes used in the construction of steam boilers?"

"In using the bumped head where the pressure is sixty pounds or more, which is the best method, to make in one piece or several pieces?"

The following officers were elected: President, John O'Brien, St. Louis; secretary, J. D. Farasey, Cleveland, O.; treasurer, Joseph Wengler, St. Louis; first vice president, Robert Monroe Jr., Pittsburg, Pa.; second vice president, M. F. Cole, Newnan, Ga.; third vice president, J. F. Casey, Chattanooga, Tenn.; fourth vice president, Peter J. Hamler, Chicago; fifth vice president, P. H. Dundon, San Francisco.

St. Louis was selected as the next place of meeting.

After the adjournment of the convention, the associate members formed an organization for themselves, to be known as the "Associate Members of the American Boiler Manufacturers' Association," the object of which is to co-operate with the active members of the association, to aid in increasing its membership and to assist in the social entertainment at future conventions.

The following officers were elected: President, W. O. Duntley, Chicago Pneumatic Tool Co.; vice president, J. T. Corbett, Chicago, Jos. T. Ryerson & Son; secretary, W. H. L. Bateman, Philadelphia; treasurer, H. B. Hare, Cleveland, Otis Steel Co.

The president and other officers were made members of the executive committee, and the following gentlemen were elected on this committee, of which the president is chairman: James W. Porch, New Orleans, Lukens Iron & Steel Co.; William Hirsch, Pittsburg, American Steel & Wire Co.; Frederick R Case, Philadelphia, Hoopes & Townsend; C. M. Fouche, Chattanooga, Crucible Steel Company of America; A. M. Chamberlin, Chicago, A. M. Castle & Co.; Victor A. Moore, Atlanta, American Iron & Steel Mfg. Co.; Thomas Aldcorn, New York, Chicago Pneumatic Tool Co.; E. M. Downey, St. Louis, Nation Tube Co.; Columbus Dill, Boston, Ashton Valve Co.

Prosperity of the B. & O. Railroad.

After a meeting of superintendents and engineers of the Buffalo & Ohio railroad, held a few days ago, it was announced that reports showed that passenger and freight traffic was increasing on main line and branches, and it was decided that work on improvements would be continued according to present plans without any retrenchment. The 77th annual report of the president and directors to the stockholders of the company, submitted at the annual meeting held Nov. 16, shows the largest gross and net earnings from operation in the history of the company. The gross earnings of the entire system, including the controlled or affiliated lines, were $68,178,676.36, and the net earnings $25,438,674.33. The percentage of expenses to earnings was 62.69. The net earnings show an increase of $2,994,158.96 over 1902.

Wyman & Gordon, of Worcester, Mass., announce that, with a view to protecting the quality of their output, they have added to their equipment a department of chemical analysis and microscopic determination of steel. They expect also to buy their fuels, oil and coal by analysis.

TRADE PUBLICATIONS.

The steel crane motors made by the Northern Electrical Mfg. Co., of Madison, Wis., are freely illustrated and discussed in Bulletin No. 32. These motors are dust proof and the field frames are made of soft cast steel, the latter cast in one piece. The field coils, commutator and other vital parts have been the subject of special attention for crane motor requirements.

"Radial Efficiency" is the title of a booklet treating of the radial drills built by the Prentice Bros. Co., of Worcester, Mass. The publication records the fact that the firm has manufactured 2,962 machines of this class up to July 1 this year. An interesting table of attainable feeds and speeds is submitted, the compilation being taken from shop records at the Prentice Bros.' plant and the holes in question being drilled and tapped in steel.

The Kahn system of reinforced concrete is explained at some length in a catalogue of the product controlled by the Trussed Concrete-Steel Co. of Detroit, Mich. Some noteworthy illustrations show very clearly the increased strength obtained by the addition of suitably formed steel rods to concrete beams and columns and the value of vertical reinforcement in concrete work.

The Cleveland Cap Screw Co., of Cleveland, has a folder on the importance of a common standard for hexagon head cap screws and hexagon nuts. The circular presents dimensions and prices of stock sizes.

An elegantly printed pamphlet depicts in miniature the several types of improved metal working machinery made by the American Tool Works Co., of Cincinnati. The illustrations can of course be supplemented by the larger prints supplied by the firm but the conveniently arranged pamphlet will for many purposes serve the needs of the works manager as well as a bulky volume. The excellence of the halftones makes up for their very limited dimensions.

"Everything in Gear Cutting" is the burden of the recent catalogue sent out by the Sawyer Gear Works, of Cleveland. Gears of many shapes and sizes are listed and there are also a few useful pages on the speed and strength of cast iron gears, horsepower of gears at various velocities of the pinch circle, etc.

The November issue of the monthly journal published by Joseph T. Ryerson & Son, of Chicago, announces that the firm has been appointed general distributing agents for the Cleveland Punch & Shear Works of Cleveland, manufacturers of power punches and shears, rolls, drills, presses, etc.

The Brown Hoisting Machinery Co., of Cleveland, has a new catalogue treating of the "Brownhoist" locomotive cranes. A number of very good halftones show the different types of cranes in use for a wide variety of purposes and there are several tables giving the detailed sizes of the mechanism, clearance dimensions, etc., with a partial list of users of this make of locomotive and wrecking cranes.

The latest catalogue of the Cincinnati Punch & Shear Co., of Cincinnati, illustrates and generally describes the line of punching and shearing machines, rolls, etc. A number of special attachments for structural and other work are also illustrated.

A series of bulletins come from the Cleveland Crane & Car Co., of Wickliffe, O., in regard to various types of cranes. These are illustrated in electric traveling, hand power, hand and electric jib, post and car forms, and the Armington electric hoists. The latter is a compact design of power hoist capable of application to the lower flange of any eye beam, suspension from a single point or from trolley, and is intended for service where a speed of one hundred feet per minute is sufficient for the bridge of the traveling crane and the cost of a three-motor machine cannot be considered.

An essay on transformer insulation by Edward A. Wagner; a pamphlet on the direct current series, Form "C," arc lamps; another on belted direct current generators, are from the Fort Wayne Electric Works at Fort Wayne, Ind.

The Morse Chain Co. of Trumansburg, N. Y., has a catalogue of silent running high speed chains. These are shown in detail and as applied for power transmission under exacting requirements.

A circular treats of the switchboards designed and installed by the D'Olier Engineering Co., of Philadelphia. Several halftones present characteristic views of switchboard installations.

A catalogue and price list of screw machine product comes from the National-Acme Mfg. Co., of Cleveland. The pamphlet is well illustrated and has a convenient marginal index.

General Catalogue No. 2 of the Michigan Sprocket Chain Co., of Detroit, Mich., extends to 128 6 x 9-inch pages, and is correspondingly complete and informing. It is profusely illustrated with views of sprocket wheels, buckets and other elevator equipment.

Catalogue H is devoted to the line of Burger gas and gasoline engines manufactured by the Woolley Foundry & Machine Works, of Anderson, Ind. The publication is unusually complete and the various details of engine construction are freely discussed. A number of interesting indicator cards are reproduced.

The Austin Mfg. Co., of Chicago, has an extensive catalogue pertaining to gyratory crushers, elevators, screens, hoists, cars and the other essentials to complete rock crushing plants.

The Hanging Rock Region.

IRONTON, O., Nov. 17.—Receiver George N. Gray has been authorized to make limited expenditures on the Culbertson plant of the Lawrence Furnace Co., in order to place it in shape for operation.

The Ironton Disc Plow Co. has leased the plant of the Ironton Foundry and will begin immediately on plans for making its own castings. Charles Alexander, for a number of years superintendent for the Foster Stove Co., has been placed in charge of the foundry.

While the work on the United States Steel Corporation's coke ovens near Welch, W. Va., has been suspended, and several thousand men are idle, the activity in coking operations in that vicinity is still pronounced. The majority of ovens along the C. & O. and N. & W. lines in West Virginia are producing and the car supply is adequate, both roads having recently added new equipment.

The stack of the Belfont Iron Works Co. is still out of blast for extensive repairs.

The B. & O. S. W. round house, at Hampden, was destroyed by fire last Thursday morning. The equipment of the shop and four engines were destroyed. The loss will be about $15,000.

The officials of the C. H. & D. visited Ashland, Ky., last week and gave some substance to the persistent rumor that this road is leading the negotiations for the property of the Ashland Coal & Iron Co. and the Ashland Coal & Iron railway. The C. H. & D. is backing the project for a bridge over the Ohio between this city and Ashland and several of the piers have been located. The bridge is to cost about $1,500,000.

S. G. Gilfillan, secretary-treasurer of the Belfont Iron Works Co., was 50 years old last Tuesday and celebrated with an elaborate banquet at the Palace Hotel, to which 150 guests, largely iron manufacturers and railroad men, were invited. Among the iron men present were B. H. Burr, J. R. Gilfillan, T. N. Martin, Oscar Richey, H. A. Marting, S. B. Steece, J. H. Moulton, E. J. Bird Jr., Thomas Parker, C. B. Fowler, J. B. Allfree, and others of Ironton; Robert Peebles, L. Putnam, F. Coles, I. A. Kelly and T. M. Adams, of Ashland, Ky.; B. M. Caldwell, of New York; and several from Pennsylvania.

The demand for the new medium speed Corliss engine recently brought out by the Ball Engine Co., Erie, Pa., has made necessary a great increase in the capacity of its works. An entirely new plant was determined upon and an excellent location was selected. These works have been under construction during the past year, and the company has just moved into them. The new works are of the most modern construction, well lighted and equipped.

Foreign agents of the American Locomotive Co. have been instructed to increase efforts to seek business for export. The company will wage an energetic campaign for export business.

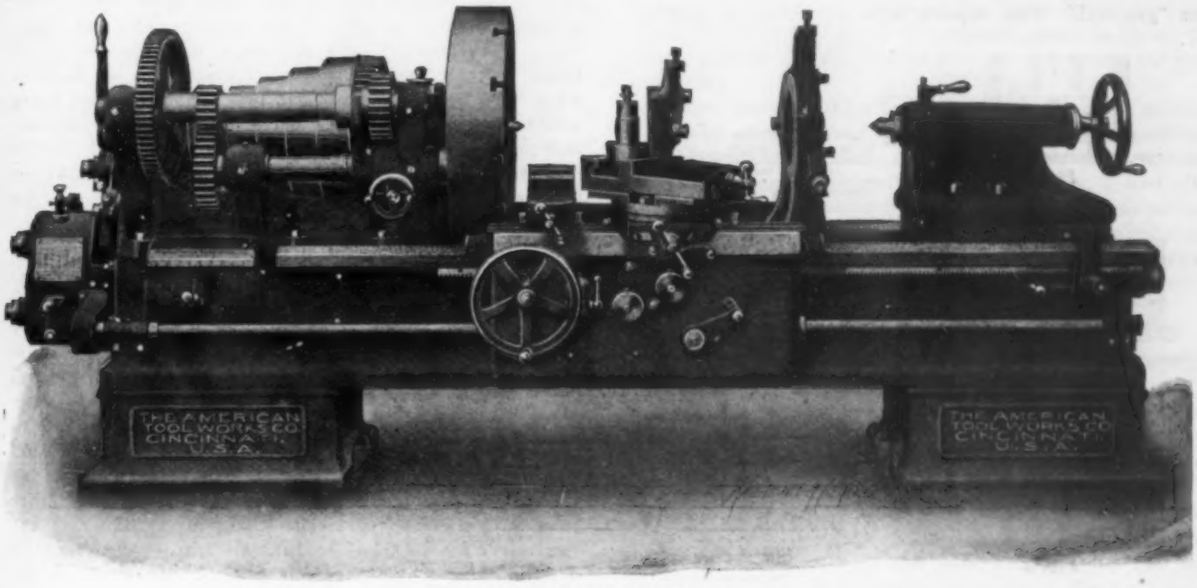
Steam was turned on and the machinery started last week in the plant of the Standard Scale & Supply Co., which has been moved from Belfonte to Beaver Falls, Pa. The buildings in this plant cover 5 acres. There are 13 different departments.

A NEW LATHE.

The illustration shows the latest lathe brought out by the American Tool Works Co., of Cincinnati. This machine is a 30-inch lathe with triple-geared head. The lathe is of unusually substantial design, adapted to the greatly increased duties now imposed upon lathes by modern high speed steels. The rapid change gear mechanism is located on the head end of the bed and through the four speed box and the cone of all steel gears, a range of 36 changes for feeding and screw cutting is provided. Each change is instantly and easily available while the machine is in full operation, without removal of a single gear. Simple but complex index plates show clearly how to obtain any desired thread or feed. The operation is a very simple and easy one, safely handled by any apprentice. Steel gears are used wherever necessary, the cone of gears being steel throughout.

The triple gears are of the slip gear-type, readily-engaged by means of a handwheel located on front of head. All gears are coarse pitch and wide face. The internal gear is cut integral with the face plate and the pinion is cut solid with the shaft.

The bed is a deep section of patent drop V pattern, which allows two inches additional swing and has rigid construction. The headstock has ample proportions, and is firmly secured to bed. The spindle is high carbon special steel, accurately ground with large hole running through it. The carriage is very heavy, especially in the bridge, due to the drop V bed, and has long continuous bearing on the ways. The leadscrew is on the inside of bed and imparts motion to the carriage directly under the cutting tool, centralizing the strain and obviating all the twisting tendency common in lathes where the pull is through the apron.



A NEW 30-INCH LATHE.

The most important contract now being figured upon in New York is for the Pennsylvania tunnels. This work has been divided into three sections and will probably be let under three separate contracts. The material which will be required for the work under Manhattan Island necessarily will be very heavy; the total tonnage of this section alone is estimated conservatively at 50,000 to 60,000 tons. The material which will be utilized in the two other sections under the North and East rivers will be relatively lighter. All told, however, the tonnage will not fall short of 80,000 tons. It is expected that the work will be let early next month.

The Pioneer Iron Co., of Marquette, Mich., is having a model of its new furnaces constructed for exhibition at the St. Louis exposition. The entire plant, stack, stoves, chemical retorts and kilns will be shown.

The Top of a Green Sand Mold.*

BY THOS. D. WEST.

In considering the top or cope surface of a green sand mold, we have to treat of means to suspend bodies of sand in a reliable form, the degree of dampness, density of sands as well as the question of open or closed risers.

In presenting these subjects it is not to be expected that all the points presented will be strictly new to those of large experience in the actual work of the molder, nevertheless there are many connected with foundries that may derive a better knowledge of principles by this paper than otherwise. Then again, most every molder of large experience has his own ways of doing things, or ideas of methods, and for this reason the paper should provoke a discussion that might prove of value to many.

In treating the first topic we can be best impressed with its importance if we will imagine a pile of sand on one hand and the top forms of some large molds on the other. It is as natural for sand to maintain forms in bottoms of molds as it is for the water of Niagara to flow over its falls, as was clearly shown by one Pat, who, when asked if he did not think it wonderful, replied, No he did not see anything to prevent the water falling. It seems to us, in looking at the under sand surface of a large suspended cope, that man is thwarting nature's laws, or, according to Pat, is doing something wonderful.

Conceding it an achievement to suspend bodies of sand, the next in order is how to do it. To undertake such work intelligently, we should first know the weight of rammed sand and secondly, the largest body that can be suspended within four walls. Tests show that on an average a cubic foot of rammed sand weighs about 100 pounds and that it can be suspended in bodies ranging from 14 to 18 inches square by 4 to 6 inches deep, the deeper the body the greater area carried. While it is true that rammed sand can be suspended to the dimensions just cited, conditions vary the size to be used. In some cases one could safely utilize bodies having an area of 14 to 18 inches square, while in others not much over one-half this area could be safely used. This is chiefly controlled by the area of the casting to be made, whether there are any bodies extending below the joint to be lifted and the head pressure of metal when pouring the molds.

In cases where the area of copes exceeds 14 to 18 inches square they are sub-divided by what we term cross bars, and give us what might be considered sub-pockets.

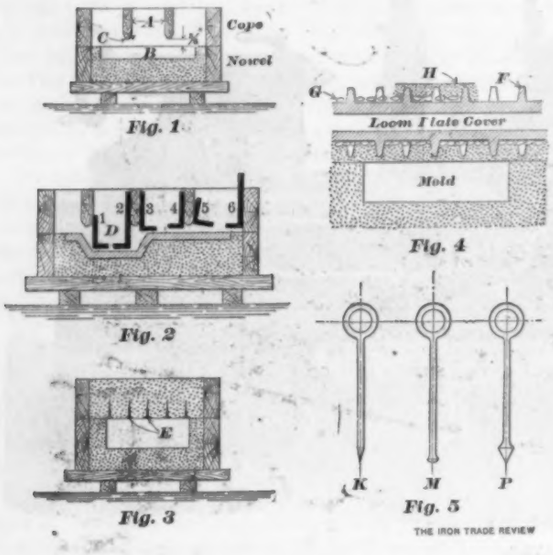
*Read at meeting of New England Foundrymen's Association at Boston, Mass., Nov. 11.

These divisions vary in form, the one of greatest utility being oblong, as by this form larger areas can be suspended than by square ones. As an example, a space 6¾ x 48 inches can be rammed to far more firmly suspend a body of sand than one of the same area put in the form of 18 x 18 inches. This illustrates a principle in cross barring copes, that if kept in mind would greatly decrease the number of "drop outs" or the release of suspended bodies in handling copes, or pushing the sand up out of the bars when molds were poured. thereby causing bad castings and often heavy losses.

Gaggers and Soldiers.

To assist cross bars suspend bodies of sand, we have recourse to what are termed "soldiers" and "gaggers," with which all founders are familiar. When and how these should be used are points that can here be profitably discussed. A "soldier" or "gagger" should be used only in cases where they are necessary to aid in the suspension of bodies of sand, or to assist in preventing the "drawing down" of cope surfaces, as their use is liable to cause an uneven surface or blow holes, on the cope side of light castings. While they are a necessary evil, there is much work that demands their use, in fact it is always best in any doubt of their being necessary to take the safer course.

The question could be asked, which is best, "soldiers" or "gaggers?" This depends upon conditions; a "soldier"



if the same length of a gagger can suspend the greatest body of sand, for the reason that its sides offer greater surface for the hanging sand to adhere and that between the bars to be packed against it.

The work most largely dispensing with the use of "soldiers" or "gaggers" is such as "stove plate." Here the faces of the bars A are evenly chamfered as at C, Fig. 1, and brought within ½ to ¾ inch of the face of the pattern B. In some cases where inferior sand is used the faces of the cross bars may have nails driven into them every 2 to 3 inches apart on both sides, or one row in the center after the manner seen at C. Some shops other than those making stove plate, etc., adopt this nailing plan in some work in preference to using gaggers. The chief objection to this lies in the projecting nails being hard on the fingers when "tucking the bars," also in the liability of molders to neglect the "tucking" on account of the nails hurting their fingers. Such neglect will leave soft spots under the bars in the cope surface to cause swells on the castings, if they were not pressed down and filled up with sand when finishing the cope.

In Fig. 2 is displayed a few good and bad practices in setting gaggers. At No. 1 is seen a gagger coming up but a short distance between the cross bars, while at No. 2 it extends the full height of the bar.

One might think any workman of intelligence would not set gaggers as shown at No. 1, nevertheless molders can be found most every day in foundries using gaggers, setting them after the plan shown. A gagger or soldier, to be reliable in suspending bodies which protrude below a joint, should extend fully two-thirds its length up between the bars as seen at No. 2. One would stand a better chance to lift a body as at D without using gaggers than to set them like No. 1, for the simple reason that the space occupied by the gagger is heavier than if it was sand, and there is no pressure to hold the gaggers between the bars.

At Nos. 3 and 4 are seen examples of practice followed in setting gaggers on sand sieved or placed over the face of patterns, wherein one is nearer the pattern than the other. Some work intelligently in this, while with others it goes as it happens. Where castings are heavy, and especially if there is any liability of the sand drawing down, it is generally advisable to have but about ¼ inch thickness of sand under the gaggers, whereas with light or thin castings ½ inch thickness is best, as by this a better chance is afforded the escape of gases and the avoidance of hard spots which often cause defects in the cope face of thin castings. These are also often caused by the careless practice many follow of having a lot of flour paste or lumps of clay sticking to the toes of gaggers when setting them onto the sand covering the face of the pattern. This causes mud spots that readily produce defects in the cope surfaces of thin castings. If proprietors and managers would notice these points in their passage through foundries to let molders know they knew what was bad practice in this line, there would be far less bad work due to these ignorant or careless practices. We could proceed to mention other evils in setting gaggers, but as time is limited, I will take up the question of dampness and density in selation to sands for ramming copes.

Dampness of Sand in the Surface of Copes.

There is considerable difference required in the treatment of sand for ramming copes and in forming the bottoms of molds. One peculiarity lies in the difference of freedom for the escape of steam, and which can be illustrated in a radical manner by imagining the different results in pouring molten iron into a ladle having water on its bottom and by pouring water on top of a ladle of metal. In the first case we would have an explosion that would shake the earth and scatter the metal in all directions, and in the other case no evil results other than a free escape of steam and a little dulling of the metals surface. This is so harmless that I often when in a hurry to cool off the metal in crane ladles, to get the right temperature for casting, pour one or more pails of water on top of the metal. The only thing to guard against in doing this is not to press the chilled crust under the molten metal to melt it before all signs of dampness on the surface of the crust have disappeared. It is not to be understood by this that we can in all cases have the top surface of molds excessively damp or approaching a muddy condition. There are cases however when we require the extremes of dry and wet sands more than in the formation of bottoms. These extremes are to be found in light and heavy work, and are due in the case of light work to the sudden contact of metal against a large surface, while in the case of heavy work it is due to the exposure of large suspended surfaces to high heat. To illustrate the first we will take the case of large boiler fronts. In pouring such castings the metal must as a rule be rushed in with all practicable speed, and in castings over ¼ inch thick the metal flows over the bottom in a thin body until it is all covered; it then rises in a fairly uniform body until it strikes the cope surface and pops up the risers to denote the mold is filled. The filling of such molds and lighter ones is so sudden there is little time given for the escape of steam or gases, and hence there is greater need of precaution in preventing their creation and providing means for the free liberation of what may be formed.

It will be noted that I have used the terms steam and

gas. While moisture, a compound say of two parts of hydrogen and one of oxygen, gives a gas that will burn, as can be seen by the blue flame when throwing water on a cupola bottom, I make a distinction on the grounds that steam is due to moisture, while gases are due to the minerals in the sea coal, facing and the sand. While it is true that we have the gases from both steam and minerals to contend with, their actions are of such a distinct nature we should consider them as separate agents in order to attain correct conclusions in fathoming ill results due to their existence.

In considering the amount of gases that can be created from the minerals, sand and moisture contained in a mold it is but a step farther to perceive the necessity of creating as little of these gases as possible and providing a rapid exit for their escape.

When the gases are excessive and confined, we experience defects in the cope surfaces of light castings, much more so than in medium or heavy ones. These defects may be in the form of wavy rough surfaces, smooth concave indentations, corners, edges and plain parts not running full to the shape of the pattern, and "cold shuts." These defects are caused by the steam or gases forming a cushion between the mold and metal, and are aided by dull metal. The hotter the metal the longer time afforded the gases to escape before the metal sets or solidifies. To avoid these defects we must use the sand as dry as possible, ram it after the manner to be shown and use the vent wire freely in connection with good hot metal.

"Drawing Down" and Skin Dried Copes.

Having shown the necessity for using sand as dry as practical, we will now show wherein the reverse is advisable, and which lies in the making of heavy castings having large cope areas that will be exposed to the direct heat of metal during the time a mold is being filled. Take the case for instance of making a casting 4 to 6 inches thick by five or more feet square. Here, from the time we start pouring until the mold is filled—from one to four minutes—the top of the mold is exposed to the intense heat of the rising metal, and should a mold be poured short to wait for iron, it might be exposed for five to fifteen minutes. A conception of the heat which such cope tops have to stand can be had by considering how a flat body of green sand would be affected were it suspended a few inches above the surface of a large ladle of hot metal. It will be evident that the heat from such a body must be very effective in drying the surface sand exposed to the heat of the metal. This is found to be the case in the daily practice of making heavy castings, and has resulted in causing much bad work and in originating the technical term "drawing down," which in a literal sense is the dropping down of sand that has been dried by the heat. Molders without experience in making heavy castings, have upon starting found the top surface of their casting to come out with large flat lumps, and the sand which came from these places floated off to form depressions or cavities in other sections. Some molders have gone on making casting after casting and unable to remedy such defects, these flaws in some cases would send the castings to the scrap pile to cause heavy losses. To overcome this evil the sand used for the first inch or so on the top face of the mold must be of such a character, that instead of the intense heat drying it to a dust form, it will bake it to form a hard crust, that by being closely gagged or surface nailed as at E, Fig. 3, will not separate from the damp sand above its surface. To achieve this the sand used should be of a loamy or clayey nature, and bake hard when heated. Some localities can obtain sand that is suitable without the mixture of any other material for this work, while others must mix flour or clay wash with their sand in order to obtain a facing that will bake when heated. As a rule all this facing sand must be made much damper than that used for light castings, and aside from starting with a much damper sand, it is often a good plan in case of very thick castings or those exposing the top or cope surface over one minute to the heat of the rising metal to dampen the finished cope surface with water, or better still, mixing half a pint of molasses to about two or three gallons of water with a sprayer or brush. The surface can in that manner approach a mud and work all right for very thick plate castings, long in pouring, but which if attempted for light or quickly filled molds would cause a boil or explosion that would throw most of the iron out of the mold and endanger the workmen.

Another plan often adopted is to "skin dry" the top or to use a loam plate covering. The first is obtained by making the facing of strong loam sand or mixing weaker sands with flour or clay wash and wetting the rammed or finished surface to make it very damp for a depth of ½ inch or so and then building a fire under the cope with shavings and fine wood or gas to "skin dry" the surface to a depth of ½ to ¾ inch. This is done chiefly where the cope surface is to be exposed a long time in pouring or where sands are very weak and the mold will be filled quickly, the former causing fear of the sand "drawing down," and the latter because if left damp or of a loamy nature there would not be time for the rising metal to dry the surface sufficient to prevent the metal boiling and make defects or a bad casting. In such cases it is often best to surface nail and copes as at E, Fig. 3, in conjunction with the setting of gaggers, as with the use of weak sands there is great danger of the "skin dried" thickness parting from the green or undried upper body of the sand and by surface nailing the dry and green are held together.

Loam plate covering is used only in copes for massive castings or those long in filling where the best assurance of preventing "drawing down" is desired. This is made by casting plates with prickers, as at F, Fig. 4, and after covering the surface with fine cinders as at G, the cinders are then wet with clay wash and a strong mixture of loam, wet to a mud state is then packed on as at H, after which the whole is thoroughly dried in an oven or otherwise.

Density of Sand in Rammed Copes..

In ramming copes, we have much the same conditions to contend with that are found in bottoms. A cope 6 to 8 inches deep is best rammed by making two courses. The first course should not be over 4 inches deep, and the ramming of it by the pein should be done in a regular, close, even manner, so that the surface will be alike in density. The second course of sand is first rammed by the pein and then by the butt. The second peining can be done in about half the time required for the first course, all that is necessary is to press the pein down solidly to feel the first course in spaces 2 to 3 inches apart, whereas the first course requires all parts of its body penetrated with the pein. After the second peining the butt end of the rammer is used, and upon this dependence must be most largely placed for obtaining the density necessary to maintain the sand between the cross bars while handling the cope and pouring the mold. Some, in ramming copes under 8 inches deep will avoid the second peining by putting in the greater depth of sand for the first peining and finishing with the butt. With copes 4 to 6 inches deep this may often answer, but with those of 6 to 8 inches deep the plan is not as a rule a desirable one to follow, as it does not afford the chance of obtaining the even density or degree of hardness of the face secured by the two peinings.

To hold the sand reliably in a cope, the butting is of the greatest utility. It not only packs the sand most solid, but also saves time and labor. It is used but once, no matter how deep the cope, or the deeper the cope, the more courses of peining, reserving the butting as a rule for the last course.

The surface of light work copes should be softer than with heavy work, and either class will require harder ramming on the face to a certain limit, according as the height of head pressure is to increase in pouring the mold. Two thin castings having the same density of cope sur-

face, but one having a higher head pressure than the other, would differ in thickness, although made off from the same pattern.

Venting and Vent Wires.

The methods used for venting copes are regulated by the density and dampness of the sand, also class of work being made. Light work copes should for plain plate work have the vent wires pushed closely to the surface and not over one inch apart, while with heavy plain plate work, the vents are best kept within ½ inch of the surface and may range from 2 to 3 inches apart. Where there are projections, closer venting will be required in heavy as well as light work. The advantages of close and distant venting will be understood as one considers the reason given herein for the liberation of gases.

The sizes of vent wires used range from ⅛ to 5-16 inch, the larger wire being used for heavy work and the deeper the venting or cope the larger wire necessary. A feature that will strike some as being unscientific and will be new to many, lies in the difference seen in the points of the vent wire at Fig. 5. A novice in their use would select K as the one to offer the least resistance to force when being pressed into the rammed sand. A trial of both K and M will surprise the novice; much less force is required to press M than K. Some, to obtain advantage of the point feature, combine the two to have vent wires appear as at P, but the point in use does not have the ease that one would think it should. However in the case of wires over ¼ inch diameter, P is a good plan to adopt.

Open and Closed Risers.

In treating the question of open and closed risers, we take up a subject where molders do not agree; one or two writers hold that all risers should be kept open, while others maintain that much depends upon conditions, the writer taking sides with the second opinion.

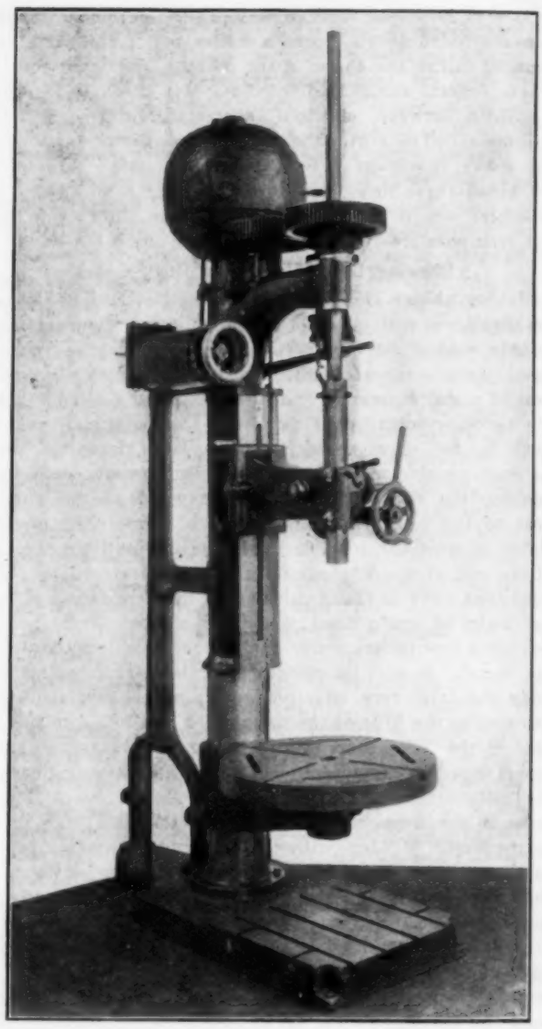
The action of risers, closed or open, is in the former case an action which maintains a pressure of air and gases between the surfaces of the rising metal and the cope, while in the latter case there is little or no pressure, accompanied with the friction of air and gases rushing through the mold to escape out of the risers. The benefits of free escape for the air and gases through venting and open risers lie in removing chances of gas cushions which might prevent the metal filling all corners, edges and plate parts of molds, cause blow holes, etc. The benefits derived from keeping all risers air tight are in maintaining an air pressure in molds that will aid in sustaining the suspended bodies and prevent the escaping air or gases disturbing pieces of the mold, lodge blacking dust and dirt under projections, etc., or be carried out of the mold, and is in a manner to be compared to what would occur if one could open and close the mouth of a volcano or in a milder way the difference in the commotion of air that prevails in and out of doors during a wind storm.

The commotion of air and gases in light work molds, aside from carrying dust, can do little harm for the reason that there is little body of metal and molds are quickly poured, whereas in heavy work we have the reverse conditions. The statement has been published in the *Foundry* that all green sand molds could be cast with open risers. I am afraid that the writer making that assertion has had a limited experience. I think I could give him green sand jobs and he could not obtain perfect castings by having open risers. I believe that another writer claimed that the face of heavy plate work was not rammed hard enough. It is true that hard ramming and good close venting may make it possible to cast certain lines of heavy plate work with open risers, nevertheless I fail to perceive wherein anything is gained in casting such work with open risers, and if there is not anything to be gained, wherein lies the advisability of taking dangerous chances?—an evil which lies chiefly in the danger of "drawing down" with plain plate surfaces and disturbing delicate bodies of sand in complicated designs to start a mold to blow, which when once begun often permits the metal to come in contact with rusty nails and rods and fills vent passages for the escape of gases with metal, causing a mold to resemble a live volcano.

DRILL PRESS WITH MOTOR DRIVE.

As an illustration of what can be done in the way of applying motor drive to an old tool the drill press illustrated herewith is unique. When the machine came into the hands of its present owner it was second-hand and so old that the dealer could not give the maker's name; now it has passed through such an evolution that it is doubtful if the maker himself would recognize it.

Originally the machine was belt driven through a cone-pulley countershaft at the base, in the crotch of the back brace, and another cone-pulley shaft at the top communicating with the spindle through a bevel gear. The shafts, cone-pulleys, belts and bevel gears have all been removed and a Crocker-Wheeler 5-horsepower semi-enclosed motor of the vertical type substituted. This is mounted on the top of the supporting column and connected with the spindle through single reduction spur gears. The speed variations are obtained



THE RENOVATION OF A DRILL PRESS.

through the motor, which is supplied with current on the Crocker-Wheeler 4-wire multiple voltage system using a 12-point controller. The highest speed of the motor is 920 revolutions per minute, the lowest 170, and the corresponding spindle speeds are 276 and 51 revolutions per minute.

The drill has a 30-inch swing and will bore holes up to two inches diameter in steel. The spindle quill receives the end thrust on a ball bearing and has a vertical travel of 10 inches within the sliding head, while the latter has a vertical hand travel, through a rack and pinion, of 24 inches. The head and spindle are counterbalanced by a weight in the hollow post. There are eight rates of automatic spindle feeding through gearing and two rates of hand feed. An automatic stop and depth gauge may be set to trip at any point and throw out the feed. The swinging table may be raised and lowered 17

inches by a hand rack-and-pinion movement, or may be swung out of the way to allow the use of the base plate. The greatest distance obtainable from the lower end of the spindle to the top of the table is 38 inches and to the base plate 52 inches. The floor space occupied is 24 x 58 inches.

NEW PLANT OF THE PACKARD MOTOR CAR CO.

The works of the Packard Motor Car Co., Detroit, Mich., are planned in a hollow square 400 feet on each side, the outside buildings clear around the square for manufacturing, and the buildings in the center for finishing purposes. Building No. 1 is the main building on the east, projecting from which are the north and south wings. Buildings Nos. 2, 3 and 4 are independent from the main building.

The only entrance to the plant is between the south wing and building No. 4, the office building being in the extreme west end of the south wing, the general sales offices being on the second floor and the manufacturing offices on the first floor. Next to the office section comes the wash room for 300 men, each man having an individual wash sink and clothes locker. The remainder of the south wing is taken up by the lathe department only.

The first floor in south half of east wing is for machine work and has equipment of screw machines, drill presses, etc. At the north end of this department is the tool crib or store room for carrying all factory tools, this section being separated by fireproof walls.

THE NEW FACTORY OF THE PACKARD MOTOR CAR CO.

The first floor of the north half of the east wing is for motor assembling and testing, and the general inspection of all manufactured work.

The upper floor of the east wing is given to the following departments: Drafting, experimental, tool room, connected with tool store room by stairway; pattern work, sheet metal work and body department, elevator being installed for handling material.

The first floor of north wing will contain erecting department for the erection of running gears and their assembling with motors.

Adjoining this department is another wash room for 300 additional men. Then comes the testing department where all gears are finally inspected, and in the extreme west end of the north wing is the gear painting department.

Continuing around the square, the north end of the power, or No. 4, building contains polishing and plating departments, and running south of this section is the blacksmith shop, rough stock and power building; the power building containing boiler and engine room.

Building No. 2 is the east center building and is used for painting, varnishing and trimming. This building is connected with building No. 3, which is the finishing building, by a covered passageway.

Building No. 4 is provided with two side tracks, one on the west side for coal siding for power house, and for the removal of the stock, and on the east side of this building and inside of the court is an additional siding for the receipt and shipment of all stock and finished goods.

The rough stock as landed in the stock room will progress round the buildings in a complete circle, entering the finishing building at one end and leaving at the other, making a complete and orderly progression for manufacturing.

As before outlined, the main and only entrance to the works will be between the office and the power building, where all operators will enter, going to the different wash rooms, and from there distributing into their separate departments without entering any other department.

The power room is equipped with direct-connected electric appliances at 220 volts. This equipment furnishes all departments with both power and light, each department having its separate motor, thereby admitting of shutting down of any one section without interfering with another.

The heating of the main building is accomplished by means of fans in the corner towers. The No. 2 building is heated by direct radiation. Nos. 3 and 4 by special fan in No. 4 building.

The equipment of the plant will be as complete as possible; including all special machines and appliances for the quick and economical production of automobile work in every detail.

The machine rooms will be provided with special lathes, boring machines, automatic screw machines, special drill presses and all requisite tool equipment necessary in a plant of this character.

The assembling and erecting floor will be provided with adequate equipment with facilities for thoroughly testing each motor under its own power as well as with other drives.

Every provision has been made throughout the entire plant for rapidity and accuracy of machine manufacturing, and as the plant has been designed especially for automobile work it is believed by the company that it will be the most complete and economical to operate which has ever been built in this country.

The Stewart Iron Works, Cincinnati, O., have been formally organized in three big companies, with a combined capital of $650,000. Two of the concerns will have headquarters at the new plant recently built at Seventeenth street and Madison avenue, Cincinnati. The structural and ornamental iron business, which is incorporated for $300,000, will remain in Cincinnati. The incorporation papers for the Stewart Iron Works Co., capitalized at $200,000, and Stewart Jail Works Co., capitalized at $150,000, have been filed at Covington, Ky. The incorporators are: Richard C. Stewart Jr., W. A. Stewart and Robert S. Stewart. The company will employ 600 men in their Covington and Cincinnati plants.

Blast Furnaces and Steel Plant of the Clairton Steel Co. at Clairton, Pa.

(With Supplement.)

In order to become absolutely independent in the matter of raw material, the Crucible Steel Co. of America, Pittsburg, Pa., about two years ago decided to erect blast furnaces and steel works, whose output would not only meet the present but the future demands of its plants. The St. Clair Steel Co. and the St. Clair Furnace Co. were organized, the former to operate the steel plant and the latter to operate the blast furnaces. As the two companies were so closely allied they were later merged into the Clairton Steel Co. A site of 175 acres was secured, fronting for nearly two miles on the Monongahela river, at Clariton, in Allegheny county, Pa. The Monongahela river division of the Pennsylvania railroad passes through the property, and in order to secure still better railroad facilities a bridge has been built across the Monongahela river connecting the works railroad, known as the St. Clair Terminal railroad, with the Pittsburg & Lake Erie railroad. Railroad connections are also afforded with the Baltimore & Ohio and the Wabash roads. With a view to future needs, 30 acres have been purchased along the Monongahela river on the Pittsburg & Lake Erie side.

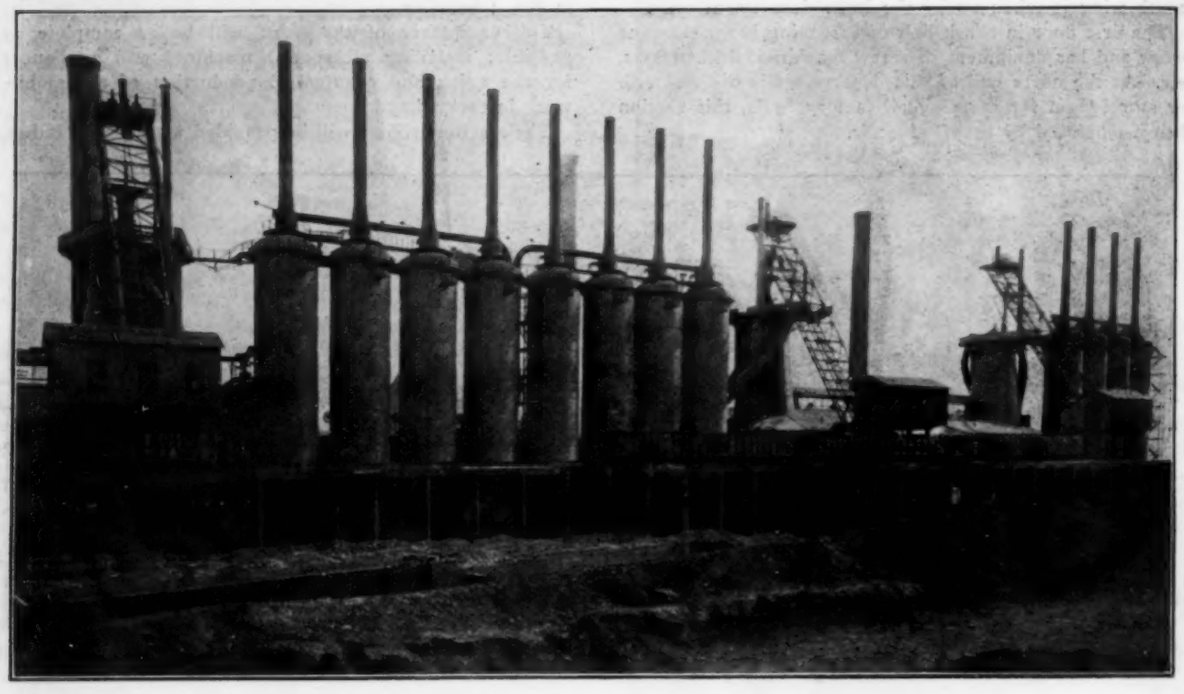


FIG. 3.—VIEW OF BLAST FURNACES, STOVES AND BIN SYSTEM.

The plant consists of three modern blast furnaces, twelve 50-ton open-hearth furnaces a 300-ton mixer, 40-inch blooming mill, 28-inch billet mill, with the necessary machine shop, power plants, etc., and all except the billet mill were designed and built under the supervision of the Garrett-Cromwell Engineering Co., of Cleveland.

The blast furnace plant consists of three stacks, two of which are now in operation, while the third will be blown in shortly. They are each 21 feet in diameter at the bosh, 14 feet at the stock line, 13 feet 9 inches at the hearth, and 85 feet high. They are equipped with the Julian Kennedy closed top. Each blast furnace is blown through 12 tuyeres. The bosh diameter is very large in comparison with the height, being especially designed for the use of nearly all Mesabi ore. The wisdom of the large bosh diameter has been proven by the excellent results that have been obtained from the two stacks now in operation, both having passed the 500-ton mark shortly after they were blown in, while furnace No. 2 recently produced 630 tons in 24 hours. The work of the furnaces has surpassed even the most sanguine expectations, as the estimated output when built was placed at 450 tons. Except the Champion mine, all the ore properties of the Clairton Steel Co. are on the Mesabi range, the Champion ore being used chiefly in the open-hearth steel furnaces. The stove capacity of the furnaces is large compared to their size, each stack having four three-pass Massick & Crook's stoves, 21 feet in diameter and 95 feet high. Each stack is equipped with Otis electric double inclined skip hoists.

Ore-Handling Plant.

The ore-handling equipment is of the most modern type, and is now being completed by the Brown Hoisting Machinery Co., of Cleveland. It consists of an electrically operated car dumper or unloader designed to handle 60-ton ore cars, or loads (including the weight of the car) of 160,000 pounds at the rate of 30 cars an hour. The material is dumped from the cars into a bin of 150 tons capacity and equipped with the Brown patent spouts, gates and gate operating mechanism, from which the material is drawn off into bucket cars. There is a system of six electrically operated bucket or transfer cars and a suitable equipment of self-dumping tubs of 7½ tons capacity. This bucket car equipment takes the material from the bin at the tipple to any convenient point along the front of the yard from which the buckets are handled by the bridges and dumped either on the stock pile or into the storage bins. Two Brown patent traveling electric bridge tramways have a span of 300 feet with a cantilever extension over the bins of 46 feet and an extension at the pier end of 19 feet 3 inches. The total length over all of sheave supports is 369 feet. These bridges are designed to handle either the automatic dump tubs, of 7½ tons capacity, a shovel bucket of 7½ tons capacity or a 2-rope grab bucket of 5 tons capacity, the shovel bucket or grab bucket being used to take material from the stock pile and load either into storage bins direct or into cars running on top of the bins, which dump the ore at any desired point in the bins.

The bridges are designed for a load suspended from the trolley of 24,500 pounds. A system of Brown patent parabolic suspension storage bins has a capacity of 13 tons of ore per lineal foot, and 3 tons of coke per lineal foot, the storage

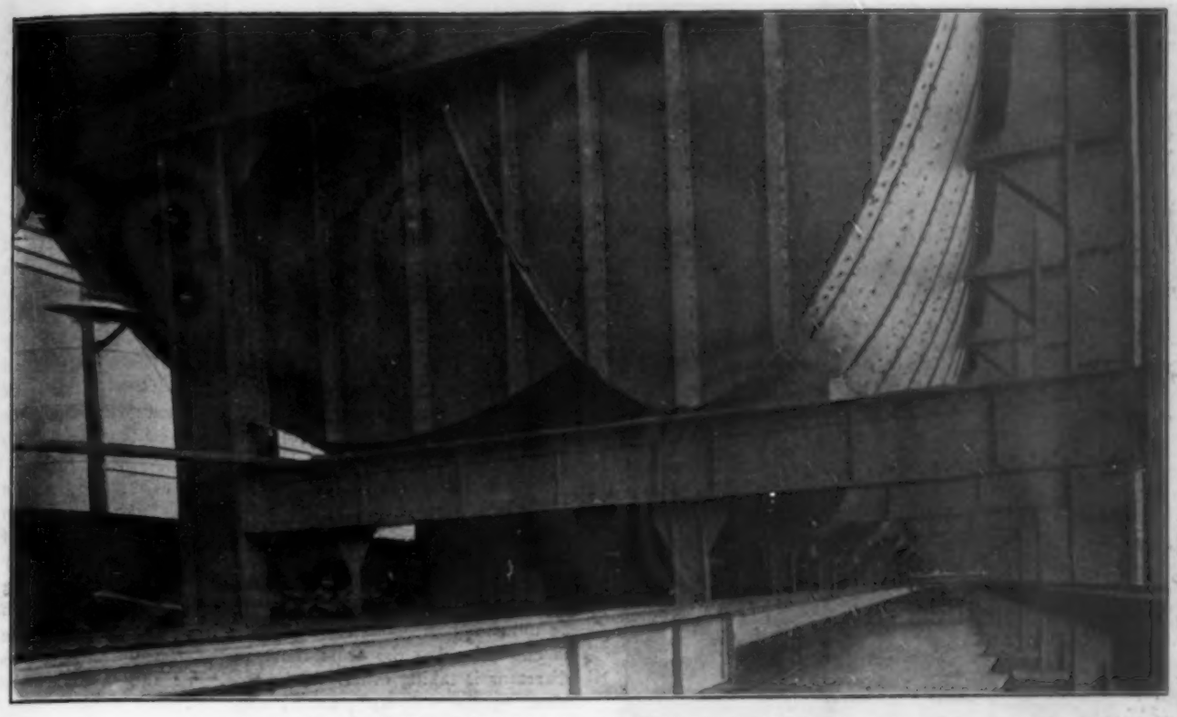


FIG. 4.—ORE, COKE AND LIMESTONE POCKETS, WITH LARRY.

bin for coke being built parallel and attached to the ore storage bin and having the shape of a half parabola. The ore storage bin forms one side of the coke bin. The total length of both ore and coke bins is 712 feet with openings opposite the furnaces. The pockets in the line of ore bins which are adjacent to the furnaces are used for the storage of limestone, the bins being divided into pockets of 14 feet 1 inch each and as many of these pockets being reserved for the storage of limestone as desired. Underneath the bins is a system of spouts and gates equipped with suitable mechanism from which the ore, coke and limetone are drawn off into larries running on tracks underneath the bin. There are 90 of the gates underneath the ore bin which are operated from the larry and by motor and mechanism which is also placed on the larry and attached to any gate as desired by means of a jaw coupler. The spouts under the ore bin are so arranged that ore can be drawn out into the larry on either track.

Underneath the coke bins there are 45 chutes and gates similar to those under the ore bins, except that they are operated by hand instead of by the motor on the larry.

Running on a double line of tracks underneath the bin is a system of six electrically operated charging larries equipped with 75 cubic feet hoppers, scales for weighing material, etc. Tracks extend the full length of the bins so that material can be dumped into the skip car at any furnace, by any larry; there being three furnaces, two larries would ordinarily be in use at each furnace. There are three coke larries having hoppers of 120 cubic feet capacity which are attached to the ore larries running on the track underneath the coke bin, and are

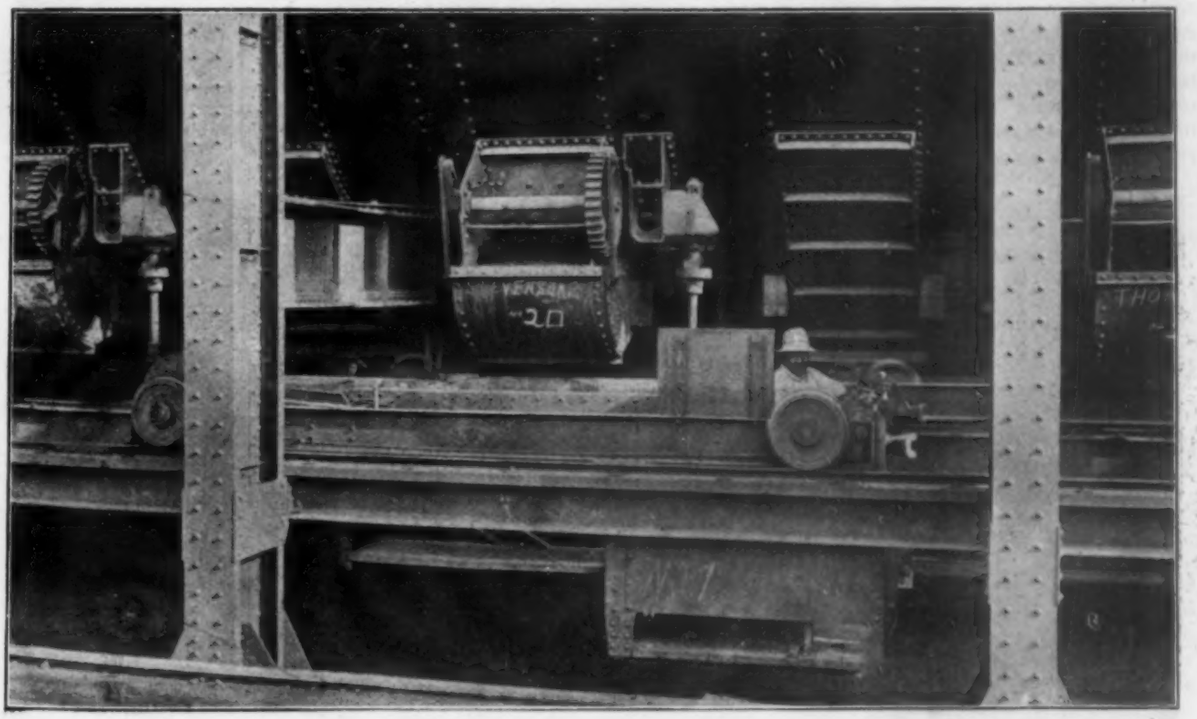


FIG. 5.—LARRY IN POSITION UNDER BIN CHUTES.

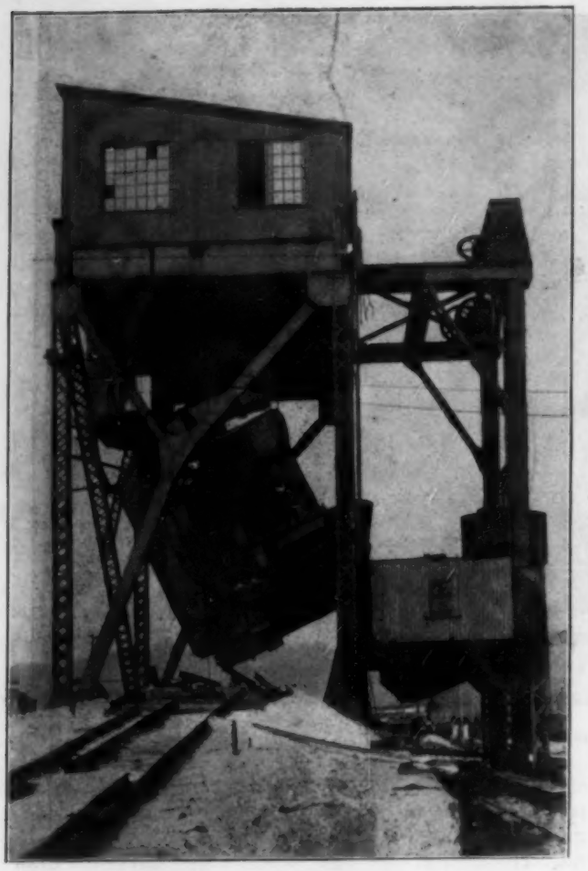


FIG. 6.—BROWN CAR DUMPER.

operated by the same operator that controls the ore larry on this track.

Arrangement of Ore Yard.

The general arrangement of the yard is as follows: Next to the railroad tracks which are on the side of the yard farthest from the line of furnaces, there is a storage yard of large capacity for storing loaded cars, and also for the storage of the empty cars after they have left the car dumper. At the side of this storage yard next to the furnaces is a track on which the car dumper is placed. A system of switches enables the cars to be run in from any storage track onto the track leading to the tipple. The loaded cars, after they have been pushed down by locomotive or run down by gravity to a point near the tipple, are pushed up an incline into the tipple by means of a "ground hog" or disappearing car which runs into a pit below the track, enabling it to get out of the way of the loaded cars. After a car has been run into the tipple and dumped, the "ground hog" pulls another car up onto the incline and into the tipple, pushing the car which has just been dumped, out of the way, down an incline from the tipple from which the car is automatically switched back into the storage yard for empty cars. Only one operator in the tipple is required to unload the cars and switch them back into the storage yard after they have once been run down to the point where they can be reached by the "ground hog."

The tracks for the transfer cars run along the yard parallel to the storage track and are so arranged that the loaded cars after leaving the storage bin at the tipple are automatically switched back on the track underneath the pier of the bridge, and when the buckets have been emptied by the bridge the train of empty cars continues on down the track to the end of the storage space and is then switched back onto the track which takes them underneath the bin again, the switches being arranged so that they are thrown automatically, no switchmen being required.

Between these transfer tracks and the storage bin at the furnaces is a space about 300 feet in width and 1,000 feet in length which is used for the storage of the various kinds of ore and limestone. This entire space can be covered by either bridge so that if desired both bridges can be working upon the same kind of ore at the same time, or one bridge can be unloading ore onto the stock pile while the second bridge is either loading ore from the transfer system into the bins direct or is taking ore from the stock pile and supplying the bins.

The runway tracks for the bridge tramways are arranged to straddle the bucket car tracks, the tipple being placed at one end of the yard so that no crossings are required for the bucket car tracks over the crane tracks. In other words the transfer cars never have to cross the tracks which carry the bridge tramways.

One operator in the house on each tramway is all that is required for the handling of either the dumping tubs, shovel bucket or grab bucket, and when the bridges are using either the shovel bucket or the grab bucket, one man is all that is required for the handling of the ore from the stock pile into the bins. When the transfer cars are being used two men are required on each train of cars, to hook on and unhook the tubs, and a third man is usually employed to move and control the train of cars.

The tipple is operated by two 130-h. p. Elwell-Parker Electric Co. motors. Each bridge also has two 130-h. p. motors. Each bucket car holds two buckets and the cars are run in pairs, every car having a 35-h. p. motor, but only one car has controller and operating mechanism, so that an operator runs two cars.

The larries underneath the storage bin have a 7½-h. p. motor for moving the larries, and a 6-h. p. motor for operating the gate mechanism. This same size motor is used for operating the gates under the bin at the tipple. The hoppers in the lar-

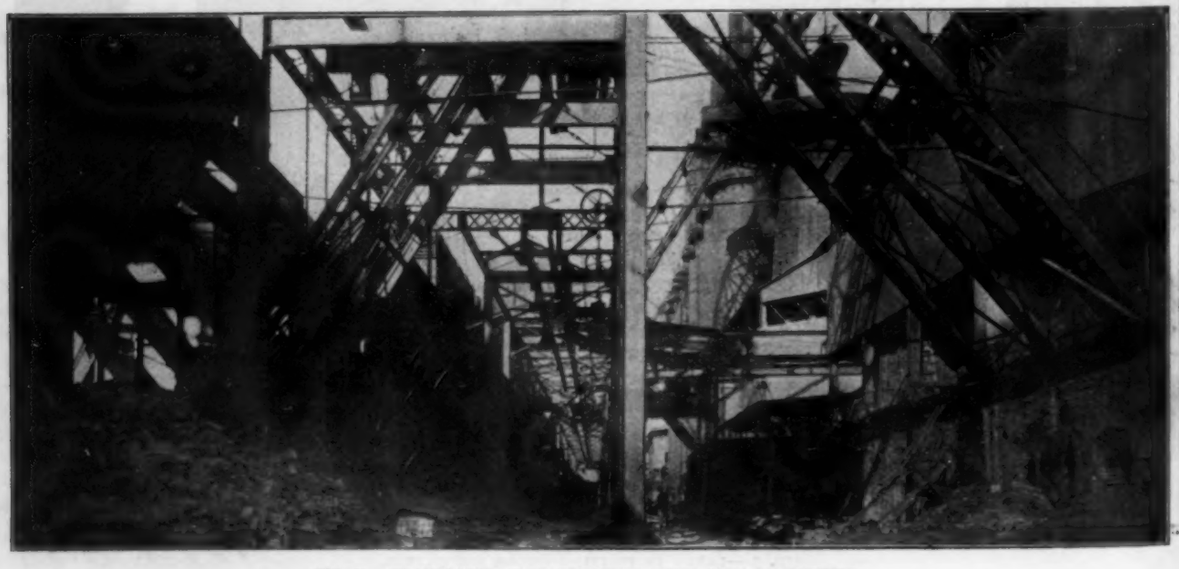


FIG. 7.—GRANULATED SLAG CONVEYOR OVER LINE OF EMPTIES.

ries are dumped by hand, one operator being required to run the ore larry and the coke larry which is coupled to it; to operate the gates underneath the bin, weigh the material and to dump the same into the skip car. In the case of certain kinds of ore it is necessary sometimes to have a second man on the larry to loosen up the ore in the bins, although this could be done by the operator by taking a little more time for each load.

Blast Furnace Equipment.

Blast is supplied to the furnaces by seven cross-compound condensing steel type blowing engines, each 48 and 84 x 84 x 60 inches, installed by the Southwark Foundry & Machine Co., of Philadelphia, these providing ample blowing capacity with one engine in reserve. Exhaust steam from the blowing engines is condensed by a 15,000-h. p. Weiss counter-current condenser, also installed by the Southwark Foundry & Machine Co. This condenser also handles the exhaust steam from all the auxiliary machinery, the pumping station, and the electric power plant. Steam is supplied to the entire furnace plant by a battery of 12,000-h. p. Babcock & Wilcox water tube boilers. These also supply steam to the electric generating plant and the pumping station, both of which are located in close proximity.

Provision has been made for handling the slag by either granulating it in pits and loading it into railroad cars, or running it direct into cinder cars in the molten state. Two pits serve the three furnaces, stacks Nos. 2 and 3 having a common granulating pit. The slag after being granulated is taken from the pits by grab buckets operated on an overhead traveler which commands the two pits, and extends almost the entire length of the furnace plant, being located between the furnaces and the ore bins, underneath the skip hoists. From the grab buckets the slag is loaded directly into cars and as a track extends the entire length of the traveler a large number of empty cars can be placed into position for loading, preventing frequent switching which is the case when only one or two cars can be placed at one time.

The iron is cast into ladles at the furnaces and run direct to the open-hearth plant, but two pig casting machines have been installed by Heyl & Patterson so that the iron may be cast in this way as occasion requires.

The electric generating plant consists of three 550-k. w. Westinghouse generators, each direct connected to a horizontal cross-compound condensing Porter-Allen engine. Ample room is left for additional generators as may be required by the growth of the plant. The pumping station is equipped with three Wilson-Snyder pumps, each of 10,000,000-gallon capacity, and driven by three vertical cross-compound condensing engines. Additional space has been assigned for pumps to meet future requirements.

Open-Hearth Plant.

The open-hearth building is 1,010 feet long by 119 feet wide, and has a stock yard addition of 72 feet running the entire length of the building. The stock yard is on a level with the charging floor, permitting the stock to be taken in the

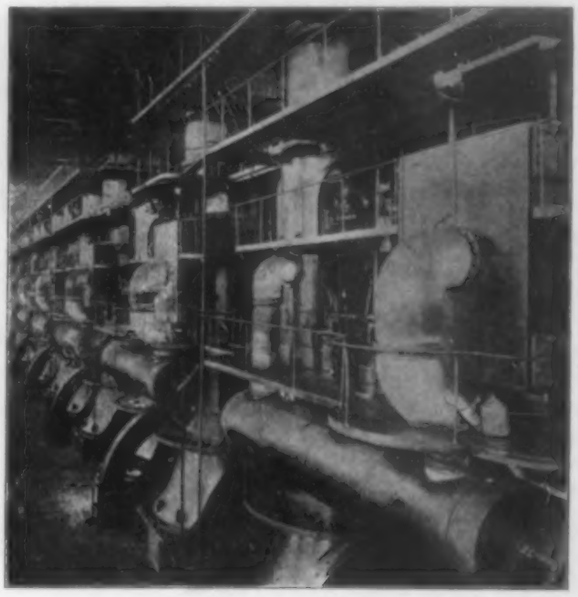


FIG. 8.—BLOWING ENGINES.

side of the building. This building contains twelve 50-ton stationary furnaces, which are at present operated with natural gas, but are built with ample regenerative chambers that they can be put on with producer gas at any time should the circumstances require it. The furnaces are raised 10 feet, allowing the pouring floor to remain at the general yard level. They are charged by three low type Wellman electric charging machines, and the crane equipment consists of three 75-ton ladle cranes, one 40-ton furnace crane, and four 5-ton yard cranes, all built and installed by the Morgan Engineering Co. The steel is cast into 18 x 20 inch and 18 x 30 inch ingots on cars which are switched to the blooming mill, passing under a pair of Aiken vertical hydraulic ingot strippers. The ingots are passed on to the soaking pits, which are commanded by two vertical electric Morgan charging cranes.

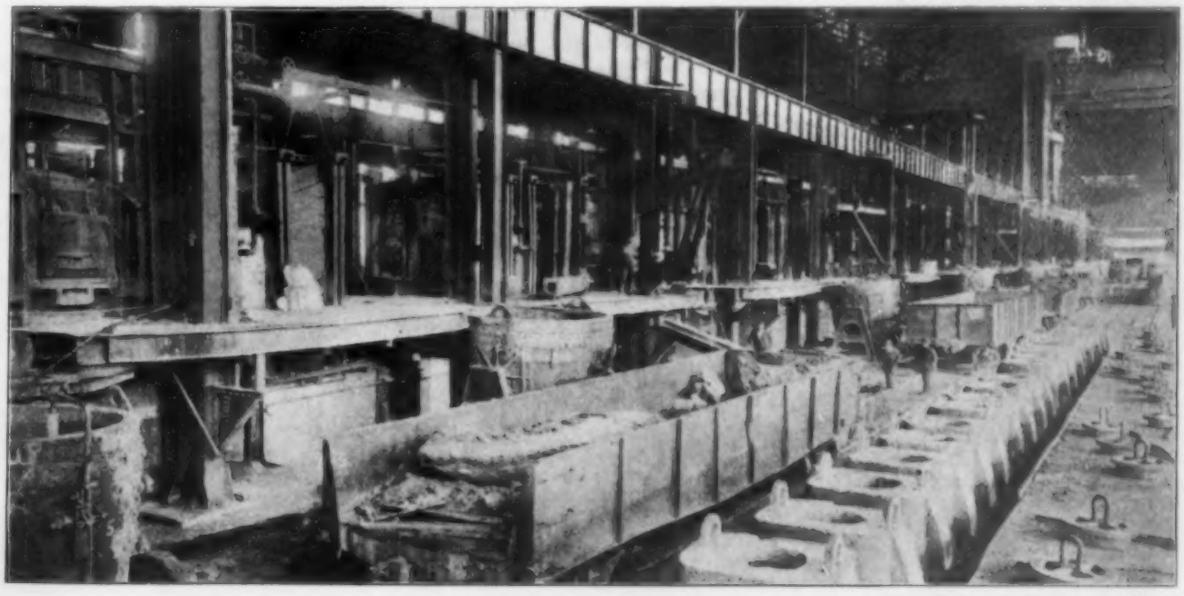


FIG. 9.—POURING FLOOR OF OPEN-HEARTH DEPARTMENT.

In the open-hearth building is now being installed a 300-ton mixer equipped with regenerative chambers and stack which will be natural gas fired and will also be arranged for the use of producer gas. The iron from the furnaces will be charged into this mixer, from which it will again be poured into ladles for use in the open-hearth furnaces. It is also the intention to produce steel by the Bertrand-Thiel process when this mixer is in operation, the Crucible Steel Co. of America having secured the sole American rights. In addition to mixing the iron, in order to secure uniformity, a portion of the total of 20 percent of scrap used in this process of steel-making will be charged direct into the mixer through an opening in the top and will thus be melted before being charged into the open-hearth furnace. In operating the open-hearth plant according to the Bertrand-Thiel process, half the furnaces will be run as primary and the remainder as secondary, the partly refined steel being drawn from each primary furnace in the regular ladle, and transferred to a secondary furnace in which the scrap, not used in the mixer, has been previously charged and melted. A large stock of ingot molds is constantly carried and to facilitate handling a 5-ton crane commands the ingot mold stock piles. The soaking pits are five in number, each of four holes, with a capacity of four ingots each, making a total capacity of 80 ingots. The ingots are transferred from the soaking pits to the blooming mill by means of an automatic electric transfer buggy. The 40-inch blooming mill was built by Mackintosh, Hemphill & Co., of Pittsburg, and has a number of special features, among which is the Fawell patent hydraulic counter-balance and roll changing arrangement, thereby removing all counter-balance weights and cylinders from below the floor. The manipulator used in connection with this mill is of the Garrett-Cromwell design. By means of oscillating links on the heads the operator is enabled to edge and hold in place large slabs which constitute the major portion of the material rolled on this mill. The blooming mill table is direct driven by an Otis reversing engine, connected to side shaft. The billet shears were built by Mackintosh, Hemphill & Co. and have a capacity of cutting hot steel 28 x 8 inches in section. These shears are equipped with a special Garrett-Cromwell design tilting shear table shown in the illustration. By dropping the end of this table a large opening is left which allows crop ends to drop directly upon the scrap conveyor. All machinery in this mill, excepting blooming mill tables, are operated by Westinghouse electric motors. The mill is driven by a pair of 55 x 60-inch direct-connected Mackintosh-Hemphill engines. The steam plant consists of 13 500-h. p. Stirling boilers, equipped with Roney stokers and Heyl & Patterson coal and ash handling machinery.

FIG. 10.—CHARGING DIRECT METAL INTO OPEN-HEARTH FURNACES.

Billet Mill and Billet Transfer.

The blooms and slabs after being sheared pass from the blooming mill in a direct line on roller tables to the 28-inch three-high billet mill, designed to roll 6, 5 and 4-inch billets, and built by the Mesta Machine Co., of Pittsburg. In addition to rolling billets to the sizes named above, bars may be roughed on this mill suitable for any finishing mill that may be added. The billet mill is operated by a Mesta vertical-horizontal engine, 40 and 68 x 60 inches. The billets are sheared by duplex hydraulic shears with a capacity of 1,000 tons in 12

FIG. 11.—BLOOMING MILL AND BLOOM SHEAR.

hours. The sheared billets are carried from the shears by an inclined conveyor leading to a billet loading machine containing twelve pockets and from which they can either be dumped into cars or piled in the billet yard.

Blooms and slabs that are not to be broken down on the billet mill, and which are to be shipped or piled in the stock yard are dumped into bloom buggies by means of an automatic push off located half way between the blooming and billet mills. These buggies are located on a circular track and when one is filled it is moved its length by a hydraulic pusher and another empty car takes its place to be filled. When the filled buggies reach that portion of the track extending outside of the building, the steel is lifted from the buggy by means of a crane and either loaded direct into cars for shipment, or piled in the yard for inspection. This yard and "merry-go-round" arrangement is commanded by two 10-ton and one 25-ton cranes. The automatic push-off as well as the movement of the cars on the "merry-go-round" are operated by one man, this arrangement greatly reducing cost of handling as well as being decidedly novel.

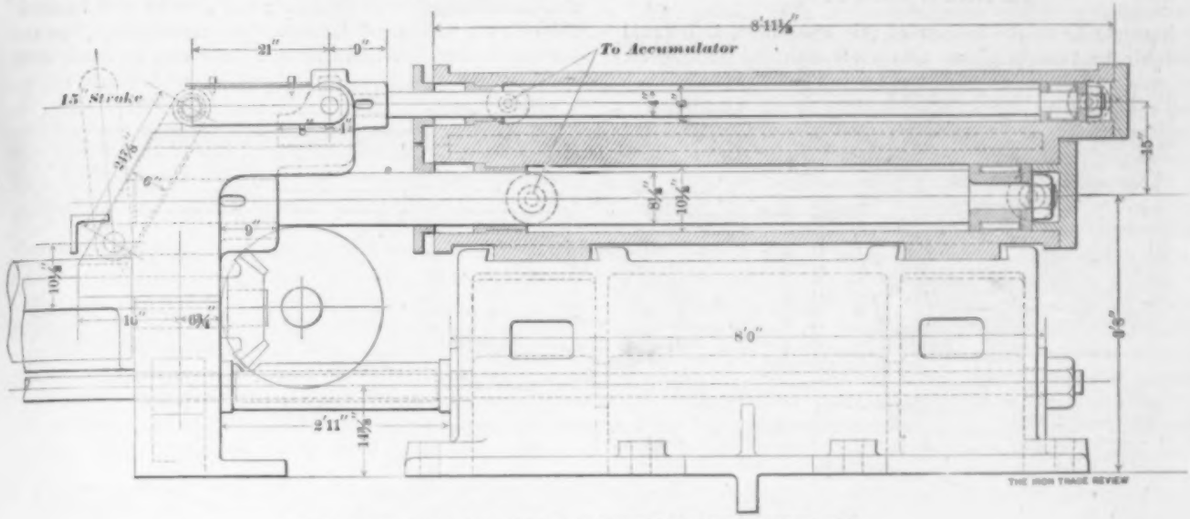


FIG. 12.—SECTION OF GARRETT-CROMWELL PATENT MANIPULATOR.

The Bon Air Coal & Iron Co., Nashville, Tenn., has decided to put in blast the old Warren furnace near Lyle Station, on the Centreville branch of the Nashville, Chattanooga & St. Louis railway, and to increase the output of the coal mines at Eastland. The company is now building 200 coke ovens at Eastland. An officer of the company says that as the price of iron declines the cost of producing it also declines, and the fact that the company intends rehabilitating the old Warren furnace is evidence that the furnaces are not losing money.

The Future of the Machine Tool Trade in the United States.*

BY WILLIAM LODGE.

The future of the machine tool trade in the United States, is a subject in which all of us are vitally interested. Our experience of the last two years has shown wonderful changes and developments in the power applied to a lathe, both in electric drives and also in belt power. I have no doubt that our neighbors on the other side of the pond are just as much alive on the subject as we are, and while they may not develop anything so wonderful as to be able to market it on this side in the face of the tariff; still unless we are on the alert I have no doubt that they will secure the markets of the world, and the markets of foreign countries will become, in the very near future, the most important markets for the output of the factories of this country. It is very necessary, therefore, that we should become as keenly alive to the situation as its importance merits.

There is more need today of weight, heft and power for machine tools than the world ever saw before, and the calls made for them by reason of the advent of high speed steels, keep us in a state of uncertainty as to where the limit will be.

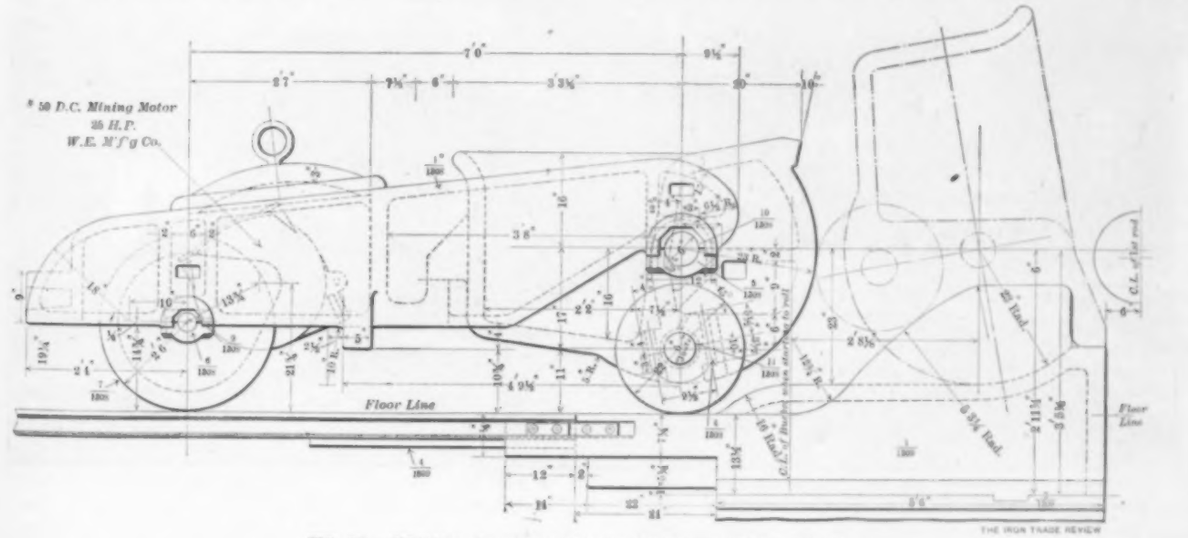


FIG. 13.—DETAILS OF ELECTRICALLY OPERATED INGOT BUGGY.

In the manipulation of steel, the high speed tool steel is applicable to almost all ordinary operations in the shop, and even the speed at which cast iron may be turned is double what it formerly was, calling for double the power in the machine. And while for this class of work it may not call for double

*Read at New York meeting National Machine Tool Builders' Association, Nov. 10.

the weight, because heretofore lathes have been used indiscriminately both for cast iron and for steel, it appears to the writer that the future will call for two distinct classes of machines, in order to meet the strenuous demands made upon them. One of these will be for the manipulation of steel, and the other one of cast iron. It will be necessary that both of them be designed so as to receive individual motor drives.

The Need of Standardizing.

It would be to the interest of this association, if it could possibly be brought about, that some standard be adopted. Why may not all manufacturers of machine tools have the same size of general bearings, the same size of nose for the lathe spindles for the different sizes of lathes, so that our customers may find it easy to transfer face plates, chucks and tools from one machine to another, irrespective of who may have been the manufacturers? If this matter can be brought about, we shall be the first country on the face of the earth to have adopted a uniformity, and I believe nearly all of our members will agree with me that it would be a most important matter, not only to ourselves, but to the men to whom we sell, and it would at least have the effect in foreign countries of securing preference for American tools, because of their interchangeability at certain points, and because of their uniformity in weight and power.

I do not advocate uniformity in the design of the machines throughout, and I know it is utterly impossible to secure uniformity in the quality of the work put into the machines, but wherever goods of our class can be made with the features above mentioned incorporated, I believe it will be of great assistance. If the salesmen for the different houses were attempting to get trade in either Europe, Asia or Africa, and the statement could be made that chucks and tools could be interchanged from one machine to another, no matter who the maker was, it would be bound to result in a preference for American goods. As we are all likely to have to make new designs, it would be well if it were possible, to bring about this interchangeability. Would it not also be well to establish uniform widths and diameters for countershaft pulleys and for the countershaft itself, because these vary so much as to,

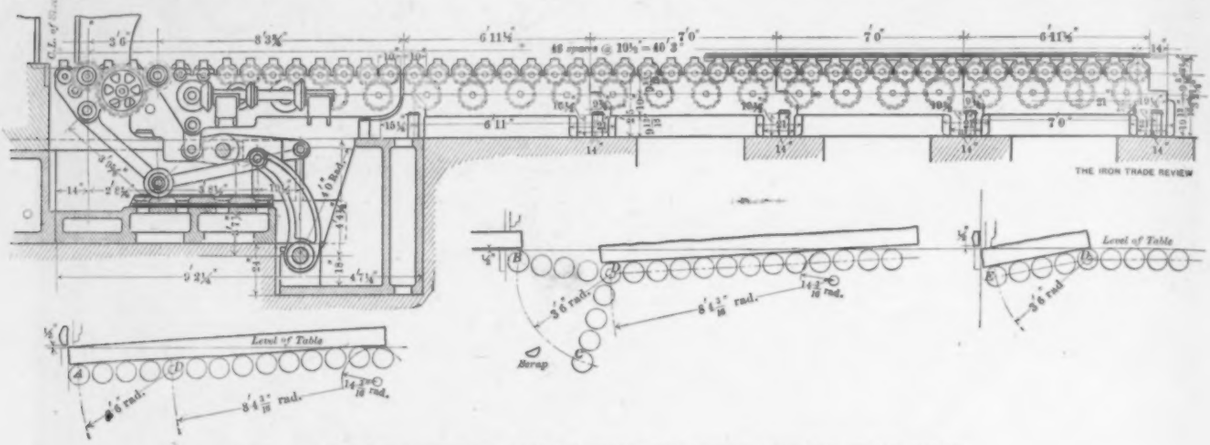


FIG. 14.—SECTIONAL VIEW OF GARRETT-CROMWELL PATENT MOVABLE SHEAR TABLE.

But one operation required to operate entire lifting end of table. Position *A D*, shearing ingots of extreme weight and length. Position *B D*, shearing while large ingot is in motion. Position *C D*, scrap falling through while large ingot is in motion. Position *E D*, shearing small light weight ingots.

at times, appear ridiculous. The future market of the United States is going to be the world's, and if we can make the world understand that every article of commerce that passes from this country to that one, at least in our line, shall be thoroughly worth the money charged for it, shall we not by this means secure their confidence and with it their future business? In addition to this, if some uniform arrangements could be made establishing the terms upon which American goods could be bought by foreign houses, we should be doing a service to the whole United States, as there is always a tendency on the part of the concerns with large capital to grant terms with which the man with small capital finds it a hardship to compete. It is purely a question of making the matter understood in the first place, and afterwards having peace and uniformity in this particular.

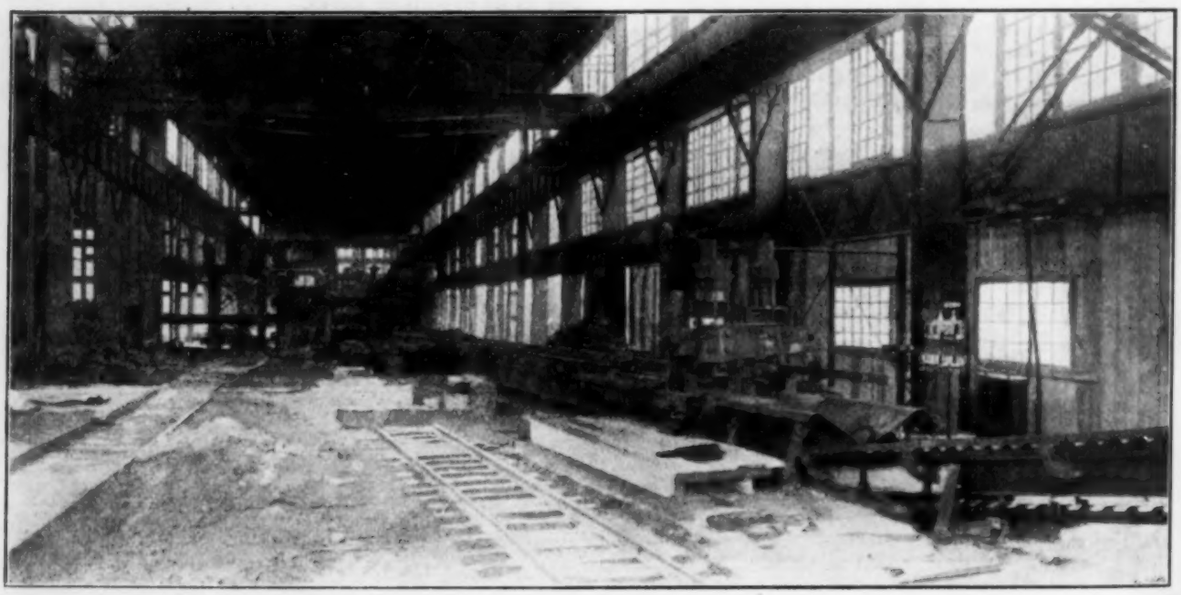


FIG. 15.—CONTINUOUS BILLET MILL. DUPLEX SHEARS AND BILLET CONVEYOR IN FOREGROUND.

Ruinous Long Time Payments.

How often do we find here in our own country, that goods are sold on long time. The buyer, of course, is always ready

to take every advantage possible, and yet there is nothing so ruinous to the manufacturer as these long time payments. In the clothing business, the dry goods business, the shoe business, it is not an uncommon thing that goods are shipped out, say Jan. 1, and that bills dated April 1 with the terms six months beyond that, with possibly 5 percent for cash, and, as competition becomes keener, in machine tool lines, this very set of conditions is likely to be brought about unless something is done in the early stages looking towards the payments being made, at the very outside, at sixty days. Thirty days would be preferable, and sight draft with the bill of lading attached the best of all, in which case the goods will be paid for before leaving New York. It might appear to many of our members that the advice thus given is too far in advance of the time when it will be needed. Personally I do not think so. I believe, with the acceleration of speed and feeds, and the general manipulation of metals, in addition to the large extensions that have been made by tool builders, that when our factories are all running full we shall be more than able to take care of the wants of all of our customers, and must either run with less men or with less hours or look for foreign markets. We are all well aware of the economy of running our shops full handed and full time. I have found in our own experience, year by year, comparing the entire expenses of all descriptions with the entire pay roll, that it has ranged from 55 percent to 140 percent. I mean by this that when you have a large fixed income and a very small output, the expense is likely to reach anywhere from 100 percent to 140 percent of your pay roll, while with the same fixed expense and a very large output, the expense may come down to 50 percent of the pay roll.

Uniform Terms for Foreign Business.

All of the above items are matters of interest to this association, and if action can be taken looking to uniformity of design, and approximately of weights, and interchangeability of certain parts, and a proper set of terms arranged for the foreign business, we shall all profit by it. It is so frequently said that a gentlemen's agreement could never be carried out. This sounds like a sad commentary on the American character, and if the Machine Tool Builders' Association could be the first of all the associations to actually and truly live up to such an agreement as this, what an example to the world it would be! How unfortunate, how ruinous, and I might say, how almost idiotic, is the voluntary reduction of price by single individuals. Every manufacturer knows quite well that a reduction of price by one manufacturer means that this price shall be made by another one, and that every dollar taken from the selling price comes from the profit, and that no more goods are sold because of a reduction in price, the reduction merely giving the party who sells at a low price a temporary advantage over his competitors. But he has given away to the consumer that much of the profit, and possibly compelled one hundred other manufacturers who did not wish to cut the price to do so.

Methods of Reducing Prices.

If there is a necessity, and I admit that such necessity may come, for a reduction in price, why may we not make a uniform reduction? This would at least let the customer know when he touched bottom. If each individual is permitting the customer to hammer him down in his price, the customer is really more unhappy than the manufacturer, because he is never sure whether he has bought his goods at the right price. When the price of iron is almost cut in two, and the price of labor averages less, it stands to reason that goods may be sold proportionately lower without injuring the profits. The men who buy tools know this, just as well as we know it, and they are a little restless if they are called upon to pay as high a price as when pig iron was double the price of today, which we know is the case. Would it not be better therefore to recognize this as a fact, and give the customer the benefit of the difference in cost, so far as the price of labor and the price of material is concerned, as competition compels the customer to do this in his own business, and yet, if the association could have this sufficiently well impressed upon the members that the necessity for only a given amount of reduction is as important as it was when we made a given amount of advance, will it not accrue to the benefit of the whole association? Is there not a sufficient field for every member of this association to preach this gospel, not only to its own members, but to manufacturers in the same line of business that are not members? Every article of merchandise is worth what is uniformly asked for it by all the different vendors, but if one vendor can make a price of 5 percent less than another one, and a further search discovers still another party selling the same article for 10 percent less, the customer is always uncertain whether he is getting the goods at the right price. We are all well aware that the margin of profit is already down to a low figure, and anything that we can do to stop ruinous cutting will undoubtedly result to our advantage.

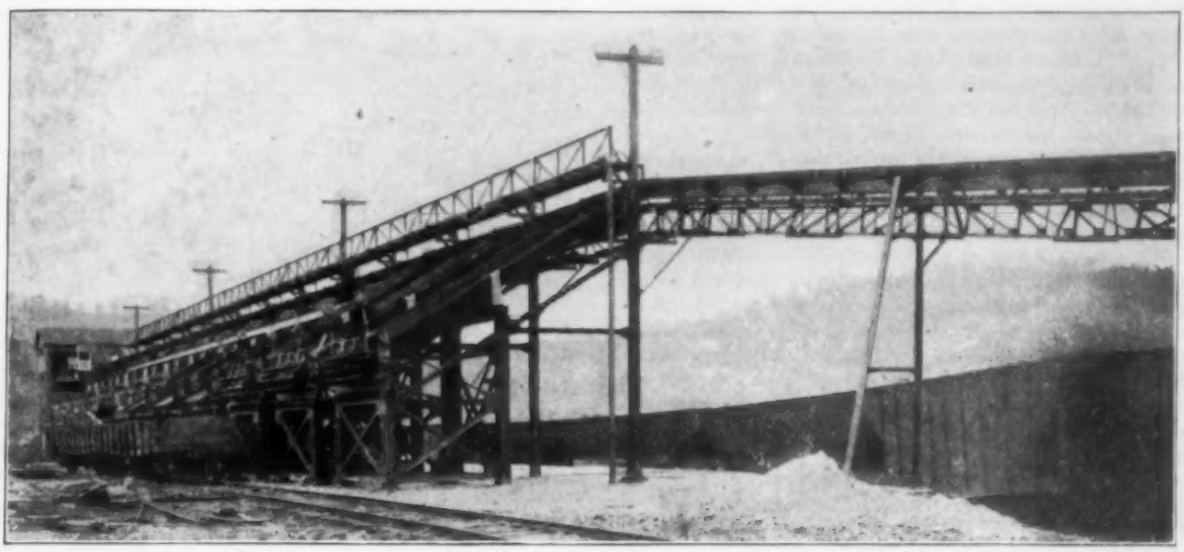


FIG. 16.—BILLET CONVEYOR AND POCKETS.

Possibilities of the N. M. T. B. A.

The National Machine Tool Builders' Association, if all its members will work honestly, and faithfully, with the end in view of benefiting each of its members, is capable of providing the means of making each individual business much more profitable than it has ever been before, for the reason that being a combination and having each and every plant handled in most cases by the men who built them from the ground up, gives them advantages that could not possibly be obtained by such a corporation as the United States Steel Corporation. The latter consists of a large number of plants gotten together hurriedly, and in forming the combination the original builders of these plants sold their interests and got out, so that the entire mass had to be handled in an entirely different manner. While great economies were possible in the

marketing of the goods, they are very lame in the management of the manufacturing features. This leaves the principal advantage in their possible control of the market for selling. Our combination has all the possibilities of controlling the selling price, providing each and every one of our members has a sufficient amount of good will, honesty of purpose, and faith in one another to open their hearts and show prices and stand by them. What matters it to each individual manufacturer if the price of any other manufacturer is five, ten, fifteen or twenty percent lower than any other one, so that all the members know just where that price is? Each one will take its place in the market as being of the value asked for it, and if all the other members are sufficiently honest, so that we always know where the price is, it then becomes a question how well the goods are worth the price asked, and the salesmanship of the men employed to sell the goods.

We will meet with some difficulty in establishing prices on electrical drives, but a free intercourse with each other would probably enable us to line up this feature so as to avoid serious losses. I do not advocate an abnormally high price, because of the necessity of our doing a large export business, and if our prices are too high, it would shut us out of the export market, but if we can prevent their becoming any lower, it will be of undoubted advantage to us all.

Steel Companies Ask for Lower Freight Rates.

The traffic officials of the Carnegie Steel Co., National Tube Co., Jones & Laughlin Steel Co., Crucible Steel Co. of America, Illinois Steel Co., Republic Iron & Steel Co., American Steel & Wire Co., Lorain Steel Co., the Lackawanna Steel Co., Cambria Steel Co., American Bridge Co., American Sheet Steel Co., and the American Tin Plate Co. have addressed the following communication to the Trunk Line Association:

"You are doubtless aware of the fact that the iron and steel business of the entire country is in a depressed condition, which has resulted in a large decrease in demand, and a consequent closing down of a large number of furnaces and mills. This condition naturally affects the interests of the transportation lines proportionately with the interests of shippers and we believe that the railroad officials will agree that the question of reduced rates of freight should have their serious consideration. We are hopeful of a better condition prevailing in domestic markets, and meantime we are looking beyond the limits of this country to secure a market for some proportion of our product, but we are met with competition from Great Britain and Germany, whose prices are based upon labor costs much below those prevailing in this country, and it will be necessary for us to make our prices approximately on a basis of our net costs, or a trifle above, and in some instances, below net costs.

"There are many advantages to the transportation lines growing out of the operation of our plants, and we feel that it is but fair and right that the railroads should join with us in an effort to secure foreign business, by a sweeping reduction in the transportation cost from our mills to the seaboard, and we therefore petition you to present this to your association, and we ask that for export traffic, rates shall be established to the seaboard of not over 50 percent of the present domestic rates. We are deeply interested in this subject, and feel that it should have the immediate and serious consideration of the executive officials of the railroad companies and beg to say that if desired we will in a body, or represented by a committee, appear before the proper officials to present our case and maintain our position as above outlined."

Furnace No. 3 of the Tennessee Coal, Iron & Railway Co., at Ensley, Ala., has been blown out for repairs. The work will commence immediately. The furnace plant proper will be practically rebuilt, along the lines adopted by the company of keeping the plants in first class modern condition. At least two months may be required to complete the work on this furnace and have it ready for relighting.

The Shelby Steel Tube Co., Shelby, Ind., has laid off about 100 men for an indefinite time. The storehouse contains a large supply of tubes.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Champion Shoe Machinery Co., St. Louis, has been incorporated by James B. Dobyne, George A. Dobyne and George L. Corcoran, to manufacture and deal in shoe machinery; capital stock, full paid, $50,000. Offices at 3337 Franklin street.

The Charlotte Brick Co., Fort Mill, S. C., wants single or double-cylinder hoisting engine or boiler with one drum, duplex steam, 4 or 5-inch suction and steam-hoisting drum of 6 to 10 horsepower.

Wilson Livery Co., Spray, N. C., is in the market for a 7-horsepower engine, slide valve.

Rhyne Weave Mills, Gastonia, N. C., wants a 14 or 20-horsepower gasoline engine.

Anniston Furniture Factory, B. M. Markstein, president, Anniston, Ala., wants prices on 100-horsepower automatic and slide-valve engine and 80-horsepower horizontal return tubular boiler.

Alman Lumber & Mfg. Co., Jonesville, S. C., wants to buy engine and boiler.

Savannah Locomotive Works & Supply Co., Savannah, Ga., is in the market for 36-inch-gauge locomotives not to weigh over eight to ten tons, suitable for running on wooden rail, either separate or saddle tank.

Antler Coal & Coke Co., No. 10 Law building, Lynchburg, Va., is in the market for a carload of light steel T rails, 15 tons of 16-pound and 5 tons of 12-pound, new or second-hand; prices to be quoted f. o. b. Antler Siding, W. Va.

Union Springs & Northern railway, W. M. Blount, president, Union Springs, Ala., wants prices on 2,000 tons of relaying steel rails, either 40, 50, 56 or 60 pounds or less. State when and where delivered.

L. Arkin, consulting engineer, Industrial Museum, Moscow, Russia, wants drawings, estimates, illustrated description and full particulars for a complete equipment of repair shops, with modern tools, for an electric steel railway line 200 miles long, using 400 cars.

Piedmont Mining & Lumbering Co., Frank F. Taylor, engineer, Kemp's Creek, Ala., wants to buy 5,000 feet or more of 18 to 24-inch iron pipe; also a distributer.

Vermont Slate Co., Granville, N. Y., is in the market for fittings for a 150-horsepower boiler and a water heater.

The Benjamin Harris Co., New York City, has been incorporated with a capital of $2,000 to manufacture metal novelties.

The Mountain State Scale Specialty Co., Lewisburg, W. Va., capital $100,000, has been incorporated to manufacture, buy and sell scales. The incorporators are: W. E. Nelson, Charles L. Dice, S. A. Scott, John C. Dice, Fred Wallace, of Lewisburg, W. Va.

The Milne Boiler Co., Hempstead, N. Y., has been chartered to manufacture and sell steam boilers, steam generators, etc. The capital stock is $10,000. The directors are: John J. Saunders, Lucy B. Macdonald and Simon Shaeffer.

The Ajax Forge Co., Chicago, capital $250,000, has been incorporated to manufacture machinery.

J. D. Sisler and P. C. Sisler, his son, have organized the Taite & Sisler Co., at Wilmington, Del., to engage in the manufacture of sheet metal goods. The capital is $200,000, and the plant will be located in Philadelphia.

The Currey Mfg. Co., Enid, Okla., has been incorporated with a capital of $50,000. The incorporators are: E. P. Currey, H. H. Watkins, G. D. Orner and J. F. Curran, all of Enid.

C. T. White, who until recently was manager of a manufacturing concern at Wabash, Ind., has formed a stock company which will be known as the Niles Foundry & Specialty Co., and expects to carry on a general foundry business at Niles, Mich.

The Jarvis Engine & Machine Works, of Lansing, Mich., are about to buy machinery for the manufacture of sheet steel tanks, smoke stacks, breechings, etc. They will buy new or second hand punch, shear and set of bending rolls.

The Gas Engine Starter Co., Toledo, O., capital $10,000, has been incorporated by John F. Holtzman, David H. Commager, Henry J. Jarvis, Charles G. Grau and John A. Coutt.

The company will manufacture automatic starting devices for gas engines used as motive power for launches and automobiles.

The A. B. Hazzard Machinery Co., St. Louis, Mo., has been incorporated to manufacture and deal in machinery and do exploration drilling. Capital stock paid in is $2,000.

The George Miles Co., Winsted, Conn., has been incorpotated to manufacture and deal in pneumatic specialties, air compressors, elevator drops, tubes, carriers, heaters, boilers and general iron work. Capital stock is $50,000 and the concern is to start on $10,000. The incorporators are: George Miles, of Hull, Mass.; Alfred Schoff, of Norfolk, N. J.; Martin Sauter, of Winsted; and Davis J. McSweeney, of South Boston, Mass.

Fires and Accidents:—

The new foundry of Turk Bros., Kankakee, Ill., collapsed on Nov. 11. Defective construction and a strong wind caused the walls to fall in. Loss $5,000.

New Construction:—

The Gem City Stove Foundry is erecting a large warehouse at Quincy, Ill.

The Colean Implement Co., East Peoria, Ill., has broken ground for a new pattern shop and foundry. The foundry is to be 50 x 120 feet, and the pattern shop, 20 x 50 feet.

The O. K. Stove & Range Co., Louisville, Ky., is having plans prepared for a new foundry to cost about $10,000.

The Locomotive & Machinery Co., Montreal, Can., has obtained from the Dominion Government authority to increase its capital from $1,000,000 to $3,000,000. The company intends to extend the works at Longue Pointe.

The Powers Machinery Co., of Clarinda, Ia., expects to begin work in its new plant at once. It will carry on a general foundry business.

The J. E. Porter Co., Ottawa, Ill., has started work on the construction of a new foundry 60 x 160 feet.

A new foundry is to be built at Coeur d'Alene City, Idaho, to take care of the work of the Spokane & Coeur d'Alene Electric Railway. It will also carry on a general foundry business.

Work on the new brick addition of the Ashland Foundry & Machine Works' plant, Ashland, Ky., is being pushed forward rapidly.

The new foundry of the Ashland (O.) Steel Range & Mfg. Co. is ready for the machinery and cupola, which are expected daily.

The Capital Foundry, of Springfield, Ill., reports that its new foundry, 100 x 150 feet, is about ready for work. The foundry is thoroughly equipped in every way, being provided with the Pawling & Harnischfeger traveling crane and a complete modern equipment in every respect.

A brick addition to be used as a foundry is soon to be added to the plant of the Phillips Insulated Wire Co., at Darlington, R. I.

A foundry building, 62 x 442 feet, will be constructed by the Dowden Mfg. Co., of Prairie City, Iowa.

The Dent Hardware Works, at Fullerton, Pa., will build a new foundry and make some other additions to its plant.

The Record Foundry & Machine Co., Moncton, New Brunswick, has decided to establish works in Montreal. The business in Montreal has thus far been carried on through an agency, but the company realizes that if it is to compete for the Quebec and Ontario trade and the Western markets, it will be necessary to have a plant at Montreal. It has secured a tract of land for unusually good shipping facilities by steamship, canal boat and train. The ground secured was formerly owned by the Malleable Iron Co. and the Sparham Fireproof Roofing Cement Co.

The Hoquiam Iron Works Co., Hoquiam, Wash., will enlarge its present plant and add a foundry. Considerable new machinery will be installed.

The Northwestern Barb Wire Co., Sterling, Ill., has increased its capital from $100,000 to $175,000, and contemplates making extensive additions to its plant.

Contracts for the masonry and carpenter work on the Olds Gasoline Engine Works, Lansing, Mich., have been awarded. The contracts call for an expenditure of $60,000.

Work at the Greenlee Bros. plant, Rockford, Ill., is progressing rapidly, and they will soon be ready to begin operations. The main building will be 160 x 400 feet, 4 stories. The foundry will be 160 x 500 feet, 1 story.

The extensive improvements of the Fairbanks Steam Shovel Co., Marion, O., are rapidly nearing completion. The large addition is now almost ready for the roof, and it is expected that it will be completed early in December.

The Ludlow Valve Works, Troy, N. Y., are making extensive additions to their plant. There are to be ten new buildings, including a foundry, 366 x 137 feet, all to be of brick. To facilitate the work the yard and buildings will be thoroughly equipped with a system of industrial railways. There will be one outdoor and two indoor traveling cranes, two of 10 and one of 20-ton capacity. The present output of the company will be doubled. The new plant will be one of the most modern in the country. The present plant will be converted into a machine shop and finishing department. The officers of the company are: President, John T. Christie; vice president, James H. Caldwell; secretary, F. Merriam Wheeler.

The Champion Drill Co., Avon, N. Y., informs us that, not wishing to build permanently on its old site, it will erect temporary buildings of about one-third greater capacity than that of the buildings recently burned. The company expects to have its new plant in operation within a month. Most of the machinery was not seriously damaged.

The Peacock Iron Works, Birmingham, Ala., has broken ground for a 3-story office building. This is the first of a number of improvements contemplated by the company. The foundry, which now occupies an old frame dwelling, will be moved into a new structure, and will have double the capacity of the present plant. New machine shops are to be erected later on the site where the foundry now stands.

Osbun & Parker will build a foundry at Redlands, Cal. The new building will be 30 x 40 feet, and will adjoin the machine shop now owned by the firm.

Improvements have been made at the shops of the Erie railroad, Cleveland, which cost the company about $10,000, and further improvements will be made in the immediate future at a cost of about $8,000.

A. Van Camp will erect a foundry, 100 x 40 feet, with an L, 40 x 40 feet, as an addition to his plant at Decatur, Ind. Mr. Van Camp has been operating a machine shop at Decatur.

C. W. Muholtz & Co., proprietors of the Dixie Repair & Machine Works, Bristol, Tenn., have purchased a lot, and will erect a building to be occupied as a foundry and machine, blacksmith and pattern shop. The machine shop will be started by Jan. 15. The company will make a specialty of repairing mining machinery.

A plant for the manufacture of metal window frames is to be built at 38-48 Erie street, Chicago, for Voightman & Co., on a plat of ground, 100 x 150 feet, recently purchased, the building to be two stories, mill construction, and to cost $45,000.

Work has been commenced on the improvements of the Wheland Machine Works, Chattanooga, Tenn., which will be completed early in the spring, enabling the company to largely increase its output. The improvements consist of a new foundry, blacksmith shop and power plant. The foundry will be 1 story, 110 x 200 feet. A complete electric plant will be established. Improvements will cost about $35,000.

About $200,000 is being spent by the Oregon Short line in putting up new shops and round houses at three division points, Lima, Montana, Montpelier, Idaho and Glen's Ferry, Utah. At Montpelier the expenditure will be $75,000, and at the other points $65,000 each. At each place a machine shop for the repair of engines and cars will be built. Each will be equipped with up to date machinery.

The San Angelo Mfg. Co., San Angelo, Texas, incorporated recently, contemplates adding foundry equipment to its machine shops and vehicle works.

The Aetna Foundry & Machine Shops, Spokane, Ill., which have been closed down for some time, were opened last week. Two large electric cranes have been installed, and the working capacity of the foundry has been largely increased.

About 3,000 employes of the Illinois Steel Co.'s works at South Chicago, are now idle, 1,200 more having been laid off last week.

The Reed & Zemp Harvesting Machine Works, Camden, S.

C., will erect a building 40 x 150 feet. About $50,000 will be invested.

The Southern Foundry Co., Owensboro, Ky., will build an addition, 45 x 75 feet, which will be used as a pattern shop and for the manufacture of galvanized iron. The company will spend about $10,000 in making necessary improvements and in the purchase of machinery. Everything will be in readiness to begin operations in the new department not later than Jan. 1. The company has accepted the resignation of Mr. Freeman Little, president, and elected L. D. Baer to fill the vacancy. The other officers of the company are: Frank Katterjohn, vice president; M. F. Bransford, secretary; James Parrish, treasurer; J. M. Jorgeson, manager and superintendent.

The American Ball Bearing Co., Cleveland, has nearly completed its new buildings opposite Edgewater park, on the Lake Shore & Michigan Southern railroad. The plant consists of a main building, fronting 200 feet on Seward street, 3 stories; a shop 200 x 170 feet, and the stamping department 100 x 200 feet, also blacksmith and forging departments and power plant.

The Franklin Machine Works, St. Paul, Minn., will remove in the spring to the new building to be erected at University and Pillsbury avenues, at a cost of $10,000.

The Love Mfg. Co., Corry, Pa., manufacturer of structural iron work, whose plant was recently visited by fire, has erected temporary buildings in order to take care of its fall and winter business. It expects to be running in a few days. In early spring the company will rebuild permanently.

The Loop Draught Boiler Co., Birmingham, Ala., recently incorporated, with a capital of $100,000, will shortly begin the erection of a plant for the manufacture of boilers.

The Pittsburg and Valley Districts:

Owing to a reduction in wages, the men employed at the Demmler plant of the American Tin Plate Co., McKeesport, Pa., went on strike this week. It is reported that the mill may be dismantled unless the men return to work. This will is non-union and is not governed by the scale of the Amalgamated Association.

The strike of machinists in the plants in the Wheeling, W. Va., districts was declared off this week and many of the men returned to work. The strike was declared on June 1 and has been bitterly contested. The men return to work at their former wages and have gained nothing.

The new office building erected by the Pressed Steel Car Co., at McKees Rocks, Pa., was formally opened on Saturday, Nov. 14. It is a five-story structure of brick and steel construction. In it are housed the operating officials and their army of clerks, while the executive officers continue to be located in the general offices of the company in the Farmers' Bank building, Pittsburg.

Five mills of the Homestead plant of the Carnegie Steel Co., which have been idle for several weeks, resumed operations on Monday: the 10, 23, 33, 35 and 40-inch plate mills.

No further efforts will be made to operate the Wheatland, Pa., plant of the Shenango Iron & Steel Co., and the plant is being boarded up to be closed for an indefinite period. The condition of the market at present will not permit successful operation.

The Ninth street plant of the American Steel & Wire Co., Braddock, Pa., suspended operations last week for repairs. It is anticipated that the plant will be idle for three weeks at least.

The machine tool business of the Pittsburg Shear, Knife & Machine Co., Pittsburg, Pa., has been purchased by the Erie Foundry Co., of Erie Pa. There is no truth in the report that the Erie Foundry Co. has purchased the forge, shear and knife business of the Pittsburg company.

The strike of puddlers and finishers at the Frankstown plant of the National Tube Co., Pittsburg, has now been on eighteen weeks and the indications are that it will be lost by the men. The company is making no effort to operate the plant.

General Industrial Notes:—

The Inland Steel Co., Indiana Harbor, Ind., has been compelled to shut down its entire plant owing to a weakness having developed in the walls supporting the roof over the bar mill. It is expected that it will require about a week to make these repairs, at which time all departments, except the sheet mill, will be started up again. The sheet mill will be idle until the men are willing to consent to a revision of the wage scale. They recently voted on this matter and unanimously declined to take any reduction in wages, though they have since taken the matter up with the national officials of the Amalgamated Association.

Lehman & Greentree, Washington and Quay streets, Buffalo, dealers in scrap iron and metals, make a specialty of second hand pipe, of which a large stock is carried at their yards.

The Illinois Steel Co. put into operation again last Monday its plate mill, slabbing mill and open-hearth furnaces, which had been idle for three weeks.

The Duffy-Trowbridge Mfg. Co., Hannibal, Mo., has re-elected the following officers: President, C. H. Trowbridge; vice president, C. A. Trowbridge; secretary and treasurer, W. F. Chamberlain.

The buildings and equipment of the foundry and machine shop of the National Implement Mfg. Works, Polo, Ill., are being sold by P. H. Coney, Topeka, Kan.

The new iron foundry of the Union Steam Pump Co., Battle Creek, Mich., is expected to be ready for work Dec. 1.

The plant of the Forsythe Pattern Co., at Youngstown, O., was closed down Nov. 7 for an indefinite period owing to lack of orders. It was hoped that the plant would be started again in a week or two.

The foundry of the Lloyd Booth plant, at Youngstown, O., closed on the afternoon of Nov. 7 for an indefinite period owing to lack of orders. It is hoped that operations will be resumed again at an early date.

The employes of the machine shops of the Harlan & Hardingsworth Co., Wilmington, Del., are being worked in two shifts. Fifty men are usually employed at the plant, but at present 25 are employed one week and the other 25 the next week. This plan has been adopted in the hope of holding the old force together with the expectation that new orders will come in, and thus furnish work for all.

A receiver has been asked for the Bonnett-Nance Stove Co., Chicago Heights, Ill. The minor stockholders have asked for the receiver, claiming that John J. Bonnett and Richard W. Nance practically controlled the works to the exclusion of all others, that they borrowed money from relatives at exorbitant high rates, distributing fat salaries in the family, and were arranging to squeeze the smaller stockholders out as rapidly as possible.

The Reliance Iron & Engine Co., recently incorporated at Racine, Wis., will use the plant formerly occupied by the Racine Malleable & Wrought Iron Co., consisting of two buildings, 64 x 164 feet, one for a machine shop and the other for gray iron castings. The capital stock paid in is $15,000.

Grainger & Co., Louisville, Ky., have obtained the contract for the structural steel work for the Preston hotel which is being erected in that city. The contract amounts to $70,000, and requires that the steel be in position in 14 weeks.

The works of the Niles Car & Mfg. Co., Niles, O., have been closed. It is understood that a reorganization of the company will take place and that improvements will be made.

George Boehm and T. D. Foljambe contemplate the establishment of a plant at Marion, O., for manufacturing all kinds of scroll metal work, and to make a specialty of iron and brass bedsteads.

The Leesport Furnace, Leesport, Pa., has been blown out for general repairs. This makes the twelfth furnace blown out in Eastern Pennsylvania within the past month. Those out of commission are: One at Pottstown, one at Birdsboro, the Keystone furnace, and one stack of the Empire Steel & Iron Co., Reading Pa., Macungie and six other furnaces at Lebanon and Cornwall. Several others have been blown out in the vicinity of Allentown.

Three hundred employes of the Reading Iron Co.'s pipe mill have been given employment, as the mill has resumed after being thoroughly overhauled.

The molding department of the Holly Shops, Lockport, N. Y., has been closed, and 200 or more molders have gone to Buffalo to the Snow Steam Pump Works. It is expected that the machine shops of the Lockport plant will be closed within two months.